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## A STUDY OF DISEASES OF AUSTRALIAN NATIVES IN THE NORTHERN TERRITORY.

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DURING the occupation of the Northern Territory by the army a native hospital was built in the vicinity of an Australian general hospital and staffed by the hospital medical officers, sisters and orderlies. The native hospital, having accommodation for 65 patients, consisted of an administrative hut, four huts equipped as wards and a patients' mess hut. It was situated on the banks of the Katherine River. The patients came from all parts of the northern districts of the territory and from Bathurst and Melville Islands.

The intention of this article is to describe and review the diseases met with at the hospital during the period from September, 1943, to October, 1944. It includes also an account of medical conditions found amongst natives in the surrounding settlements which were visited on occasions by medical officers. Visits were made to Elsey, Roper Valley, Roper Bar, Roper River Mission (which lies on the southern border of Arnhem Land), Monteginnie, Mooloolo, Victoria River Downs, Timber Creek, Coolebah and Willeroo, and at each of these stations a medical survey of the natives was carried out.

Approximately 400 patients, mostly full-blooded aborigines, were treated at the hospital during the period, and about 250 were examined at the settlements. The surgical conditions will not be considered here as they form a separate study. The ophthalmic conditions are being described elsewhere by the ophthalmologist, who made an extensive and detailed survey. It may be mentioned that a large majority of natives were found to be suffering from trachoma in one form or another, from the mild early infections to the most severe and complicated conditions with gross destruction and distortion of the eyelids and globe, and with deterioration and loss of vision.

The medical conditions fall naturally into two groups. The first group comprises those diseases which are usually found amongst the natives and rarely amongst white populations—namely, yaws, ankylostomiasis, *granuloma venereum* and leprosy. These diseases are endemic and ubiquitous amongst natives in the territory, and only in exceptional circumstances do the white people contract yaws or leprosy. No cases of *granuloma venereum* were seen in the white community.

The second group comprises those conditions which are commonly found amongst white and native populations, such as malaria, acute infectious diseases, acute respiratory diseases, pulmonary tuberculosis, cardiovascular and renal diseases, anæmias, nervous and mental disorders, gonorrhœa, non-specific venereal infections and other miscellaneous conditions.

### Yaws.

The first major problem that confronts a medical officer in the Northern Territory concerns the prevalence of spirochætal infections amongst the natives. A routine Kline precipitation test of the blood was performed when the patients were admitted to hospital. During the period under consideration 193 tests produced a positive result—that is, in 48% of all admissions. Thirty of these subjects who reacted to the test had lesions which were regarded as typical of yaws in an early, intermediate or late stage, and 51 had lesions which resembled yaws but could not be described as typical. In these 81 cases (20% of all admissions) the diagnosis of yaws was made. It may be reasonably assumed that the majority of the remaining 113 reactors to the Kline test (with the exclusion of the occasional positive result which may have been caused by malaria or leprosy) had had a previous spirochætal infection. The question then arises, is *Treponema pertenue* the offending organism in all these cases?

Early, intermediate and late manifestations of yaws were recognized. It was usually impossible to elicit from natives

a clear account of their past or present illnesses, and they seemed to have no conception of the measurement of time. Histories, therefore, were useless, and reliance had to be placed solely on direct observation. Therefore it was not often possible to identify the stage of the lesions in relation to the time of onset of the disease, nor was it feasible to classify lesions rigidly as primary, secondary or tertiary.

A male patient had a granulomatous ulcer on the knee and spirochætes were seen under darkground illumination in scrapings from the ulcer. The Kline test of the blood at first produced a negative result, but a week later the result was positive. The lesion was regarded as a primary ulcer and it healed after a few intravenous injections of "Novarsenobillon".

A young female adult examined at Mooloolloo Station had a similar lesion on the forearm. The solitary ulcer was about half an inch in diameter, raised, with an irregular granular surface. It was regarded as a primary lesion and treated by an intramuscular injection of "Acetylarsan".

This type of lesion was rarely found.

A female child, aged about five years, was admitted to hospital with several pale, granulomatous lesions typical of early yaws. On the upper lip there was a raised, fungating mass with overhanging margins extending along the surface of the mucous membrane where the upper and lower lips met. The mass extended a little to the buccal mucous membrane. At the left angle of the mouth the granuloma expanded on to the cheek and the lower lip, leaving a deep ulceration. In the left axilla on the chest wall were two granulomata about one inch in diameter, circular and raised above the surface. In the right axilla were two or three similar but smaller lesions. In the groin and on the perineum were a few round, yellowish, fungating granulomata. Under dark-ground illumination numerous spirochætes were seen in smears taken from the lesions. The Kline test of the blood produced a strongly positive result. The only treatment in this case was penicillin (800,000 units) given parenterally in three-hourly injections. The lesions began to shrink immediately and were almost healed after three days; after six days they had completely healed, only purplish stains without induration being left in the groin and axillæ, and no visible trace at all being left on the lips.

Another female patient, aged about eight years, had a similar but more extensive granulomatous lesion covering most of the perineum. The inguinal glands were enlarged. Also she had a discharging granuloma inside the right nostril, which was ulcerating the nasal septum and the skin margin of the nose. There was also a deep ulcer on the inner surface of the right little finger. The surface of the ulcer was granular and the margins were well defined. The finger nails of the right hand were thickened, pitted and partially destroyed. The left hand was unaffected. On the left foot was another deep ulceration between the hallux and the second toe extending to the dorsal and plantar surfaces. The surface of the ulcer was granular and the skin surrounding it on the ball of the foot was undermined for an inch or more, an area of depigmentation being exposed. The skin of the anterior surface of the legs was roughened but not ulcerated. Spirochætes were found under dark-ground illumination from a granuloma on the thigh. The Kline test produced a positive result. Again penicillin (600,000 units) was given parenterally, with improvement in a short time; in six days the lesions were completely healed, pale, raised, smooth areas covered with epithelium being left.

The rapid response of these early lesions of yaws to treatment with penicillin is proved. Further investigations are required to determine the adequate and optimum dose and to compare the relative advantages of organic arsenical preparations and penicillin.

Skin lesions that were less typical than those described above were more often seen. Some were lesions that had become secondarily infected, others were retrogressing granulomata. Raised papules, varying in size, with a flat surface, some pale, others hyperpigmented, were observed on the hands, forearms, elbows, ankles, knees and buttocks. The papules sometimes became infected and pustular or were covered with a yellowish crust. After removal of the crusts an ulcerated, granular surface was exposed. This type of lesion was seen more often on the buttocks.

This secondary infection by pyogenic organisms complicated the picture, making the diagnosis difficult. Especially in young children impetiginous sores were frequently confused with yaws. Thirty patients suffering from impetigo, all non-reactors to the Kline test, were treated. The distinguishing characteristics were the pustular crusts covering smooth, shallow ulcers, mainly on the hands, feet and buttocks and occasionally on the face and scalp. The treatment usually consisted of local applications of white precipitate ointment.

Another common skin condition which was confused with yaws was scabies. In the natives the numerous small burrows of sarcoptes quickly became infected, and large pustules were produced. Unless careful search was made for parasites or ova the scabietic origin of these lesions was overlooked. They responded well to treatment with sulphur ointment.

Chronic skin conditions were frequently seen, which were considered to be late manifestations of treponema infections or healed early and intermediate lesions. Scars were difficult or impossible to identify because of the lack of a reliable history. Most natives said that their scars were due to fire (which was not doubted) or to some accidental cause. A scar at the corner of the mouth with a smooth, raised surface and radiating bands looked typical of a healed yaws lesion,[1] but its owner maintained that it was a burn from smoking a pipe. This same native had longitudinal grooves on the finger nails with considerable irregular thickening and some excoriation. The skin on the palms was desquamating and partially depigmented. The skin on the back of the hands was dry, thickened, redundant and scaly. On the forearms the skin was thickened and scaly. Also, there were patches of ichthyotic skin on the dorsum of the feet, on the front of the calves and on the thighs. In addition he had anterior bowing of both tibiæ. The Kline test produced a strongly positive result. The skin condition was regarded as a late manifestation of yaws and there was much improvement in texture of the skin after a few intravenous injections of "Novarsenobillon".

In other cases the skin of the forearms, elbows, knees and abdomen was roughened. The surface felt like rough sandpaper. Sometimes numerous small black papules were present, sometimes large hyperpigmented papules. Localized or more general desquamation was commonly seen. The skin of the soles of the feet was thickened and fissured. Over the lower third of the tibia and over the wrists the skin and subcutaneous tissues were thickened and deeply pitted. These pitted scars seemed to go down to the bone, which was often affected with chronic osteitis beneath the affected skin. These scars had the appearance of healed sinuses or of deep ulcers. Sometimes a little discharge exuded from them. The condition was regarded as a late manifestation of yaws, although absolute proof of the spirochætal origin of the lesions was lacking. All these patients reacted to the Kline test.

Several cases of gangosa were seen; in all the Kline test produced a reaction. In the young female patient described above, an early granulomatous lesion was attached to the nasal septum just inside the nostril, and the surrounding nasal mucous membrane and skin of the nostril were ulcerated. In another female there was a large granulating area of ulceration on the upper lip extending into the nose, where excoriation of the mucous membrane and commencing destruction of the cartilage of the nasal septum were obvious. In other cases the destruction of the nasal septum led to collapse of the bridge of the nose. Advanced stages were most disfiguring, with loss of the nose leaving only an aperture. An X-ray film of one of these patients revealed complete absence of the nasal septum, loss of the turbinate bones and sclerosis of the medial wall of the maxillary antrum. This patient had other extensive bony lesions which will be described later. Intravenous injections of "Novarsenobillon" effected resolution of lesions in the active stages.

Such cases have been described in medical literature as syphilitic.[2] This is not surprising when one considers the destructive type of lesion, with positive response to the Kline test, caused by a spirochæte which is morphologically indistinguishable from *Treponema pallidum*.[3]

Bony lesions that were regarded as being caused by yaws were frequently seen, and sixteen cases of "boomerang legs" with anterior bowing of the tibiæ, usually at the

middle third, were recorded. These natives came from different parts of the territory, including the islands. Both tibiæ were usually affected. Kline tests were performed in eleven cases, and in ten positive results were obtained. The youngest patient was a boy, aged about six years, at Willeroo Station, who had tenderness of his legs when walking and bowing of both tibiæ.

X-ray photographs of several patients were taken. They showed the bowing of the tibiæ with dense sclerosis of the cortex in the curved region and a narrowing of the medullary cavity from encroachment by the cortical sclerosis. In some cases the cortical sclerosis was localized, with isolated dense patches projecting into the medullary cavity. In earlier stages localized patches of osteoporosis in the cortex occurred. This lacunar formation seemed to precede the sclerosis. The bony wall of the nutrient artery was usually well defined and thickened, and a bony spicule had formed and projected into the medullary cavity. This condition is described by Hackett.[9]

A different type of bone lesion was seen in a few cases.

A middle-aged male half-caste had considerable thickening of both clavicles and of the shafts of the long bones of the legs and forearms. There were hard, tender, localized swellings on the bones. X-ray photographs revealed pronounced changes in the bones of the forearms and in the tibiæ and fibulæ, and irregular patches of osteoporosis and periosteal reaction with new bone formation. In places widening of the bone and thickening of the cortex with some areas of rarefaction were present. In the frontal bones areas of rarefaction were seen. The Kline test produced a positive result.

A middle-aged lubra had a somewhat similar condition. She had a mild degree of anterior bowing of the tibiæ and patches of rarefaction throughout the shaft, with considerable intervening cortical sclerosis, and also a periosteal reaction with new bone formation. A similar appearance was seen in the X-ray photographs of the fibulæ. The lower ends of both radii were thickened from periosteal overgrowth, and there was a rarefied area in the distal end of the right ulna. The skin over the right wrist and over the shins was thickened, pitted and scarred. The Kline test produced a positive reaction. In addition, this patient had fluid in the knee joints, in the ankle joints and in the left elbow joint. A secondary anæmia was present, and the hæmoglobin value was 50%.

This condition of multiple arthritis in this patient would have been regarded as a manifestation of yaws, had it not been observed that she had a mitral valvular lesion with systolic and diastolic apical murmurs and a cardiac shadow of mitral disease configuration. The condition was typical of rheumatic heart disease.

The association of yaws and acute rheumatism was seen in another patient, who also had boomerang legs, a bony swelling of the lower end of the fibula and rheumatic heart disease affecting the aortic and mitral valves. The significance of this association is not clear.

In a few other cases joint lesions were observed in patients who had other bony lesions. A patient suffering from gangosa had extensive osteitis and periostitis of the radius and obliteration of the wrist joint with ankylosis, and also evidence of osteoarthritic changes in the ankle joint. Another patient had late skin manifestations and arthritic changes in the interphalangeal joints of the left hand. The distal ends of the proximal phalanges were atrophied, and the interphalangeal joints were obliterated. Another patient had osteoporosis and enlargement of the proximal phalanges with arthritic changes of the interphalangeal joints. In these cases the metacarpophalangeal joints were unaffected, and in this respect the condition differed from rheumatoid arthritis. Chronic bursitis was found in three cases; in one there was a large prepatellar bursa which had a partially calcified capsule; another patient had an olecranon bursa, and the third had cystic swellings, which contained calcified nodules, attached to the outer side of the ankle joints.

Two other interesting conditions will be described at this point, as they were both probably due to spirochætal infections.

A blind native baby was brought from Roper Bar to hospital suffering from a condition diagnosed by the ophthalmologist as interstitial keratitis, with yellowish-grey opacies in both corneæ. There was an ulcer at the angle of the mouth. An X-ray examination of the skull showed an increase in size of the anterior fontanelle. The Kline test produced a strongly positive reaction.

If a similar condition was found in a white baby, a diagnosis of congenital syphilis would undoubtedly be made.

The other patient was a female, aged about twenty years, who was examined at Coolebah Station. She was completely blind and had bilateral optic atrophy. She was ataxic, and flaccidity of the muscles of the lower limbs was present, and the knee jerks and ankle jerks were absent. The Kline test produced a positive result. The condition resembled closely *tabes dorsalis*, but she could not be brought to hospital for further investigation.

The question then arose whether these conditions were due to *Treponema pallidum* or *Treponema pertenue*. No other lesions suggestive of syphilis were seen amongst the natives; but an aneurysm of the aorta, specific aortitis, *tabes dorsalis* and other specific tertiary lesions were seen amongst the white population.

Gangosa, and the bone lesions described above, so closely resemble syphilis as to be almost indistinguishable from it. The responses to blood tests are the same, and the *Treponema pallidum* and the *Treponema pertenue* are morphologically identical. The important difference between the two diseases, if they are separate entities,[6] is that one predominantly affects the native population and the other the white population. The difference in the mode of living is probably one of the important ætiological factors.

### Ankylostomiasis.

Hookworm infestation was the next most frequently found condition; 12% of natives admitted to hospital were proved to be infested, and it is probable that many more were not discovered. As a rule no symptoms directly attributable to the parasite were seen, but the ova were found on routine examination of the stools. The affected natives came from all regions; this fact indicates the widespread dissemination of the condition throughout the native settlements. The treatment given was a vermifuge consisting of tetrachlorethylene (3·0 cubic centimetres) and oil of chenopodium (1·0 cubic centimetre) suspended in magnesium sulphate solution.

Three female patients who came from Bathurst Island had a profound secondary anæmia due to ankylostomiasis. The most severe case will be described in detail to illustrate the course and prognosis of this condition.

The patient was a child, aged about ten years, not ill-nourished, but with œdema of the legs up to the knees and a protuberant abdomen which contained free fluid. The temperature on her admission to hospital was 102° F., the pulse rate was 120 per minute and the respirations numbered 30 per minute. The palpebral conjunctiva and the buccal mucous membranes were pale, and most noticeable was the whiteness of the tongue. The apex beat was visible and palpable in the fifth left intercostal space in the mid-axillary line, and loud systolic and diastolic murmurs were heard at all areas. The percussion note at the base of each lung was impaired and crepitations were heard there. The abdomen was distended and the liver was enlarged. The spleen was not palpable. An X-ray photograph of the chest showed a greatly enlarged heart shadow, the configuration indicating a general enlargement. Mottled opacities due to bronchopneumonia were present in the right lung field. The first blood examination gave the following information: the hæmoglobin value was 15%, the erythrocytes numbered 990,000 per cubic millimetre, and the colour index was 0·75. Numerous ova of *Ankylostoma duodenale* were found in the stools. The Kline test failed to produce a reaction. Treatment was commenced with a blood transfusion of 300 cubic centimetres and a course of sulphapyridine (14 grammes) to combat the pulmonary infection. The child was delirious for the first two days and said that she could see snakes. Her condition rapidly improved in a few days, the elevated temperature gradually subsided, the physical signs in the lungs disappeared and the œdema of the legs and ascites disappeared. She was then given a liberal diet rich in vitamins, and iron. The hæmoglobin value rose steadily at the rate of 10% per week. She was given a vermifuge when it was above 40%. In the fifth week of treatment the hæmoglobin value was estimated at

80% and the erythrocytes numbered 4,200,000 per cubic millimetre; a normocytic, normochromic anæmia was present. There was an absolute eosinophilia of 14% of 7,000 leucocytes per cubic millimetre.

By the tenth week the hæmoglobin value had reached 100% and the erythrocytes numbered 5,000,000 per cubic millimetre. The apex beat was palpable in the mid-clavicular line, and only a faint systolic apical murmur was audible. An X-ray photograph of the chest showed the heart shadow to be normal. The liver margin was just palpable below the costal margin. She had gained in weight and was apparently a healthy child on her discharge from hospital.

The other two patients also had profound anæmia, enlargement of the heart and enlargement of the liver; their response to similar treatment was the same, and they were discharged from hospital in good health.

These cases illustrate the rapid response to treatment of this profound anæmia and the return to normal of the enlarged heart and the enlarged liver. Other factors may be concerned in the production of this type of anæmia, but that question will not be discussed here. The need for the treatment, and prevention if possible, of ankylostomiasis amongst the natives is obvious.

### Granuloma Venereum.

Twenty patients suffering from *granuloma venereum* were admitted to the native hospital, an equal number of males and females. The lesions consisted of red granulating ulcerations on the external genitalia and perineum. In the males the granulations were usually on the fold of the prepuce and on the glans. In some cases separate lesions were present in the groins, but they always had the same characteristic appearance. The margin of the granulations was raised above the surface of the healthy skin and there was a clear-cut line of demarcation. The surface was sometimes covered by a mucopurulent exudate due to a secondary infection. The raised edge had an appearance not unlike an epithelioma. Healing occurred in the centre of a lesion, thickened, smooth epidermis being left, while the active edge continued to advance. The healed surface was at first depigmented and later became pigmented. The involved prepuce became thickened and fibrous. The inguinal glands were sometimes enlarged. Donovan bodies[6] were not found on microscopic examination. Various organisms including spirilla and fusiform bacilli were found, but they were all considered to be secondary infectors. In advanced cases there was considerable ulceration with destruction of the deeper tissues. In females the perineum and recto-vaginal septum were partially destroyed by the ulceration.

The treatment given was the excision of as much as possible of the diseased area and intravenous injections of a 2% solution of sodium antimony tartrate twice a week in increasing doses from 1·5 cubic centimetres to 6·0 cubic centimetres. Healing of the ulcers occurred slowly, scars being left, and the patients were usually discharged from hospital without active lesions after two or three months' treatment.

The ætiology of this well-defined clinical entity is obscure. Its response to antimony injections suggests a protozoal infection. The clinical picture was quite distinct from that of *lymphogranuloma inguinale*. No examples of this disease were seen amongst the natives.

### Leprosy.

Twelve natives suffering from leprosy were found, four with nerve leprosy and eight with the nodular type. Lepra bacilli were found in the skin or in the post-nasal space in all the cases. These natives came from widely separated regions of the Northern Territory—from Roper Bar, Roper River Mission, Timber Creek, Willeroo, Coolebah and stations along the north-south road.

In the nodular form a great change in the facial appearance occurred. The skin and the subcutaneous tissues over the eyebrows and on the forehead were thickened and irregularly fissured. The loose skin below the eyes was swollen and nodules were felt on other parts of the face and on the lobes of the ears, which were hypertrophied. The creases on the face were deep and the lips were thick. The surface of the skin was smooth and shiny and had a waxy texture. Subcutaneous nodules were felt on the forearms, on the backs of the hands, on the legs and on the dorsum of each foot. The nipples were sometimes hypertrophied.

In these cases numerous acid-fast bacilli were found on bacteriological examination of the skin. Also, acid-fast bacilli were sometimes found in post-nasal swabs. The diagnosis of this type presented no difficulty.

On the other hand, in some cases nerve leprosy was not easily distinguished from other peripheral nerve lesions which were frequently seen.

A female child, aged about ten years, had a right ulnar paralysis, wasting of the small muscles of the hand and excoriation of the tip of the forefinger said to have been caused by a burn. The results of sensory tests were difficult to evaluate. The ulnar nerve on the right side felt uniformly thickened above the elbow. Acid-fast bacilli were found in post-nasal smears.

This evidence was not considered sufficient to confirm a diagnosis of leprosy.

By contrast, another female patient, aged about eleven years, had a similar ulnar paralysis on the right side, wasting of the small muscles of the right hand and a fusiform enlargement on a greatly thickened ulnar nerve. Acid-fast bacilli were found in post-nasal smears. A search for lepra bacilli was made by inserting a hypodermic needle into the swelling on the ulnar nerve, but they were not discovered.

This patient was regarded as suffering from leprosy.

Another female native, aged about forty years, had bilateral foot-drop, bilateral ulnar paralysis, a fusiform swelling on the left external popliteal nerve and palpable ulnar nerves above the elbow; but no acid-fast bacilli could be found. Further investigations were necessary to confirm a diagnosis of leprosy.

Several other male and female natives were seen who had ulnar palsies without an obvious increase in the thickness of the ulnar nerve trunks, and from whom no acid-fast bacilli were recovered. A custom of both the males and females to fight with heavy yam sticks, causing fractures of the humerus or the ulna or a nerve injury, was the probable explanation of some of these palsies.

The treatment of leprosy was not commenced at the hospital; but patients with confirmed and probable lesions were transferred to the Channell Island Leprosarium.

### Comment.

Of the four diseases included in this group, leprosy, ankylostomiasis and yaws were occasionally found amongst the white population. The second group to be discussed includes those diseases which are commonly found amongst both the white and the native populations.

### Acute Infectious Diseases.

Apart from respiratory infections, the only acute infectious disease occurring as an epidemic was mumps. Twenty-four cases were recorded; in some of them the condition was contracted in neighbouring settlements and in others in hospital. The parotitis was bilateral or unilateral and the disease ran a mild course, subsiding in a few days without ill effect. One case of orchitis occurred.

### Acute Respiratory Infections.

Sixty-five cases (16% of admissions to hospital) of acute respiratory infections were recorded and classified as follows: six cases of upper respiratory tract infection, 27 cases of acute bronchitis, eight cases of bronchopneumonia and 24 cases of pneumonia. In the cases of bronchitis an initial fever occurred with a cough and physical signs of râles and rhonchi. Five patients were radiologically examined and the films showed no abnormality except for a slight increase in the basal lung markings. In one case a calcified, healed, tuberculous lesion was seen behind the second and third ribs. All the patients recovered in several days.

The cases of bronchopneumonia and pneumonia presented the usual clinical features—fever, dyspnœa, cough, expectoration, pain in the chest and physical signs of pulmonary consolidation with rales and crepitations. The bases of the lungs were usually involved and occasionally the mid-zone or the apical region. Treatment with sulphapyridine was effective in many cases.

During a period just before the wet season, a number of severely ill patients were admitted to hospital, and six of these died. Post-mortem examination revealed massive pneumonia in the stage of grey hepatization in three cases, localized empyema with basal pulmonary consolidation in one case, and fulminating bronchopneumonia and pulmonary œdema in one case. The remainder of the patients recovered in a few weeks and were discharged from hospital. The high mortality rate of six deaths in 32 cases of pneumonia and bronchopneumonia was not explained; but it seemed that a particularly virulent type of infection, perhaps a virus infection, was active in the area during the period just before the wet season.

During the year under consideration there were twelve cases of *otitis media* with perforation of the tympanic membrane and aural discharge. A few cases of paranasal sinusitis and four cases of acute follicular tonsillitis occurred. These cases ran a normal course.

### Pulmonary Tuberculosis.

Twenty-one patients (5% of those admitted to hospital) were found to be suffering from pulmonary tuberculosis. X-ray examination of the chest and bacteriological examination of the sputum were performed whenever the condition was suspected. It is of interest to compare the figures for non-tuberculous respiratory infections with those for tuberculous infections—16% and 5% of all admissions respectively.

In the cases of pulmonary tuberculosis various types of lesions were present. Pleurisy with effusion, subclavicular areas of soft infiltration, bilateral consolidation of bronchopneumonic distribution, generalized pulmonary fibrosis, fibrosis with the formation of a cavity at one or other apex, usually just below the clavicle, pleural thickening and irregularity of the dome of the diaphragm, calcification at the hilum of the lungs and thickening of the anterior lobar septum were the features recognized radiologically.

In two cases enlarged cervical glands were excised and histologically proved to be tuberculous. Hæmoptysis occurred rarely. Six of the 21 patients died in hospital, including one with acute miliary tuberculosis. Other complications found were tuberculous adenitis, spinal tuberculosis and meningitis. The fate of the remaining patients with active lesions was not known, as they were transferred to Tennant's Creek hospital.

It is evident that pulmonary tuberculosis is not uncommon amongst the natives, and that the course of the disease is similar to the course in white people. The frequency of the chronic lesions of fibrosis and calcification suggests that the natives have some innate power of resistance to the disease. The problem of the control of pulmonary tuberculosis amongst the natives is not so hopeless as has sometimes been taught.

### Acute Rheumatism.

Five natives were seen who had signs of acute rheumatism.

A female patient, aged about twenty-six years, was admitted to hospital with swollen ankle joints and a swollen right knee joint. The temperature was elevated, and on the third day the left knee joint was involved. There was no sign of cardiac involvement. Salicylates were given, the pyrexia subsided in a few days and all symptoms were gone in ten days.

Another female patient, aged about twenty years, had tachycardia, an enlarged heart with a loud systolic apical murmur transmitted to the axilla and an accentuated second pulmonary sound. She had previously had swelling of the joints. Two other patients had signs of mitral valvular disease and another had aortic and mitral valvular disease. The blood of this last patient reacted to the Kline test, and a swelling of the lower end of the fibula was present. The association of yaws and rheumatism has been referred to previously.

Chorea with almost continuous involuntary, irregular movements of the shoulders, trunk and limbs, more severe on the right side, occurred in a pregnant woman, aged about seventeen years. The temperature rose to 103° F., the pulse rate was 140 per minute and the respirations numbered 30 per minute. A male infant weighing two and a half pounds was born, and after the confinement physical signs of bronchopneumonia were detected. The choreiform spasms continued, and after a few days she died. Autopsy revealed pneumonia in the stage of grey hepatization and early empyema. No abnormality was detected in the brain or the heart.

### Meningitis.

There was one typical example of cerebro-spinal meningitis associated with severe headache, vomiting, neck rigidity and increased pressure of cerebro-spinal fluid; the fluid contained many polymorphonuclear cells and both extracellular and intracellular Gram-negative diplococci. The patient was treated with sulphapyridine, receiving 64 grammes in five days, and recovery was complete.

An infant, aged about five months, was brought by aeroplane from Roper River Mission. She was comatose, the anterior fontanelle was distended, the left eyelid was drooping, the pupils were unequal and the hands and arms were in clonic spasm. The patient died soon after her admission to hospital, and autopsy revealed a thick layer of pus over the cerebrum and at the base of the brain. Pneumococci were found on bacteriological examination.

An extraordinary case occurred of internal hydrocephalus due to plastic arachnoiditis of the roof of the fourth ventricle associated with granular ependymitis of the lateral ventricles. The histological picture was characterized by proliferative infiltration of the arachnoid, the chorioid and the ependyma with round cells, polymorphonuclear cells, epithelioid cells, plasma cells and giant cells. In some places throughout the infiltration were found spaces containing yeast bodies. This was probably an example of infection by *Torula histolytica*.

### Malaria.

Twenty patients were found to be infected by *Plasmodium vivax*. Some of these had no fever at all, but the malarial parasites were discovered on routine examination of blood slides. Others had typical attacks of fever. They all responded to quinine, "Atebrin" and "Plasmoquine" therapy. The natives seemed to have a high resistance against malarial infection. Two children, aged about three or four years, had very enlarged spleens and an associated anæmia with a hæmoglobin value of 50% and an erythrocyte count of 2,600,000 cells per cubic millimetre. Benign tertian parasites were found in the blood. After treatment with quinine and iron both were discharged in good health, with a normal blood picture.

### The Dysenteries.

Only four cases of bacillary dysentery were detected. These were all Flexner infections and the patients quickly recovered. There were two cases of amœbic dysentery; the patients responded to treatment with emetine injections, emetine-bismuth-iodide by mouth, and "Yatren" (2%) given *per rectum*.

### Venereal Diseases.

Besides the cases of *granuloma venereum* which have already been described, eleven patients were proved to be suffering from gonorrhœa. In addition, there were three cases of epididymo-orchitis, five cases of non-specific urethritis and seven cases of non-specific cervicitis. Many other male and female patients were examined "on suspicion". The results of treatment with sulphonamide drugs and more recently with penicillin were satisfactory.

No other specific venereal disease was identified. The absence of the primary and secondary clinical manifestations of syphilis was remarkable. This supports the theory that a widespread infection by *Treponema pertenue* immunizes the population against syphilis.[1]

### The Anæmias.

The secondary anæmias of hookworm, malaria and yaws have already been mentioned.

One female patient developed a macrocytic anæmia after a confinement. The erythrocytes numbered 2,000,000 per cubic millimetre, the colour index was 1·2, and macrocytes and nucleated red cells were seen in the film. A reticulocyte response occurred after a short period on a diet rich in vitamins, and the hæmoglobin value on her discharge from hospital was 92%.

A male patient had a profound microcytic anæmia with a hæmoglobin value of 16%. He died before investigations were completed, and at the autopsy tuberculous lymphadenitis of the mediastinum was found.

### Hyperpiesia.

An old man of indeterminate age had a systolic blood pressure of 210 millimetres of mercury, a diastolic pressure of 120 millimetres, an enlarged heart and congestive heart failure. An elderly female had a systolic blood pressure of 225 millimetres of mercury and a diastolic pressure of 125 millimetres. She died of a hemiplegia. Senile arteriosclerosis was observed, but the age at which it commenced could not be determined.

### Nervous and Mental Disorders.

There were two cases of true epilepsy without apparent mental disorder.

Another male patient was admitted to hospital in a state of catatonic stupor. His temperature was subnormal, his pulse and respiration rates were slow, the deep reflexes were absent. He could be roused, but he was disinterested in his surroundings and quickly lapsed into stupor. On the night of a corroboree he recovered sufficiently to take a vigorous part in the festival, after which he "went walkabout".

One or two patients were apparently mentally deficient, but mental tests to estimate the degree of deficiency were not devised.

### Conclusion.

This review of the diseases that have been observed during the period of a year amongst the natives in the Northern Territory may serve to emphasize the need for the continuation of adequately equipped native hospitals and the establishment of mobile medical units for the outlying settlements.

To prevent and control disease is a primary and obvious way of preventing the decline of a native race of people who are invaluable to Australia.

### Acknowledgement.

I am indebted to Major J. Garvan, pathologist, to Major M. Schneider, ophthalmologist, and to Major R. Scobie, radiologist, for reports, opinions and advice in their respective departments, and to a number of medical officers who, from time to time, have had the natives under their care and attention. I wish to thank the Director-General of Medical Services of the Australian Military Forces for permission to publish this article.

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## DYSENTERY IN THE NORTHERN TERRITORY.

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THE following notes embody our experience in the care and management of 114 patients suffering from bacillary dysentery at an Australian general hospital in the Northern Territory. Bacillary dysentery is endemic throughout the Northern Territory, although it is usually seen in but moderately severe forms. Any relaxation in the standard of hygiene in camps is commonly associated with a sharp outbreak of diarrhœa in the area.

Shortly before the commencement of these observations sulphaguanidine became available to be used in the treatment of all dysentery patients admitted to the hospital. Since this was so for the first time in our experience, the purpose of this survey was to obtain information as to what immediate cure rate could be expected from the use of this drug. Unfortunately the necessity to return men to duty as soon as possible and the large area over which units were scattered prevented any observation of patients over long periods.

It was also hoped that it might be possible to arrive at certain criteria of cure suitable for application when laboratory facilities are not available, similar to those used in the saline therapy era as described by Hone, Keogh and Andrew.[1]

### Clinical Material.

The patients consisted of members of the forces or of the Allied Works Council stationed in the Northern Territory. The diagnosis in all cases was established by the isolation of *Bacterium dysenteriæ* from the stools, and by typing by slide agglutination.

In all, 101 patients suffering from acute bacillary dysentery and 13 patients regarded as symptomless carriers were investigated. The types of organisms recovered and the number of cases in which they were found are shown in Table I.

TABLE I.

| Type of Infection. | *Bacterium Dysenteriæ* | | | | |
|---|---|---|---|---|---|
| | Flexner. | Boyd. | Sonne. | Schmitz. | Total. |
| Acutely ill patients | 100 | 1 | — | — | 101 |
| Carriers .. .. | 5 | 4 | 3 | 1 | 13 |
| Total.. .. | 105 | 5 | 3 | 1 | 114 |

As will be noted, the Flexner type of dysentery bacillus was the causal organism in by far the majority of cases. All the patients from whom other types were recovered were members of one unit in which a large number of cases of dysentery had occurred when the unit was stationed in Western Australia some twelve months previously. Thus it would appear that bacillary dysentery in the Northern Territory is essentially due to *Bacterium dysenteriæ* Flexner. This is in accord with the infrequency in which severe cases of dysentery were encountered; only in rare instances did patients pass more than twenty stools in the first twenty-four hours after their admission to hospital. In all other aspects the symptoms did not differ from those usually described.

### Treatment.

#### *Sulphaguanidine.*

*Acutely Ill Patients.*—The dosage of sulphaguanidine given was based on that recommended by Fairley and Boyd,[2] but for convenience in administration an arbitrary standard dose of 3·5 grammes was adopted in all cases. This amount of the powdered drug, as supplied, was made up as a suspension in one ounce of water. All patients were given an initial dose of seven grammes of the drug and thereafter 3·5 grammes at intervals of four hours until the number of stools in twenty-four hours was less than five. At this stage the standard dose was given every eight hours until the patient had passed his usual daily number of normal stools for two successive days. Failure of the bowels to act on any one day was not considered normal, and treatment was continued until the above condition was fulfilled. When this stage was reached the administration of the drug was stopped, provided that

in all cases a total amount of not less than 70 grammes of sulphaguanidine had been given and that treatment had been continued for not less than five days. These qualifications were made in an attempt to ensure that an adequate concentration of the drug would act for a sufficient time on the causal organism to offer a reasonable prospect of effecting a cure in any case. They were arrived at after earlier observations of the response to treatment in cases of usual severity. The average amount of sulphaguanidine given in the 101 acute cases was 104·7 grammes. The average period for which sulphaguanidine was given in the 101 acute cases was 8·1 days. The greatest amount of sulphaguanidine given in any case was 187 grammes. The longest period for which sulphaguanidine was given in any case was fourteen days.

*Carriers.*—In the case of carriers, the standard dose of the drug was given at intervals of four hours for three days and then at intervals of eight hours for a further four days—a total of approximately 109 grammes of sulphaguanidine given over a period of one week.

*Evidence of Drug Intoxication.*—In all, there were five cases in which it was thought that evidence of a toxic reaction to sulphaguanidine was displayed. A diffuse erythematous maculo-papular rash appeared in each of these cases, usually more pronounced on the trunk than on the limbs and persisting for twenty-four to seventy-two hours, and headache was commonly present. In three cases there was an associated febrile reaction; the temperature rose to 100° to 102° F., but the fever subsided within twenty-four hours of cessation of the administration of sulphaguanidine. In two of the cases in which febrile reactions occurred there was a generalized enlargement of the lymphatic glands, which in one case subsided within twenty-four hours and in the other in seven days. In this last-mentioned case sheaf-like crystals, typical of sulphonamide, appeared in the urine, but these disappeared within forty-eight hours. In no other case did microscopic examination of the urine reveal any abnormality. The amount of sulphaguanidine given prior to the onset of toxic symptoms varied from 91 grammes to 125 grammes, and it is of interest to note that in two cases, in which no febrile reaction occurred, the rash did not appear until after cessation of the drug therapy, in one case twenty-four hours later, in the other forty-eight hours later. This incidence of toxic manifestations (five in 114 cases) appears to be rather higher than that usually recorded with similar dosage. Two factors would appear to play a part in this: (i) excessive sweating due to the prevailing hot climate, leading directly to an increased plasma concentration of the drug by dehydration and adding indirectly to this increase by reducing the urinary output with an associated reduction in drug excretion; (ii) slow progress through and elimination from the bowel, with a resulting increase in absorption of the drug. This factor appeared to operate in two cases; one patient was a symptomless carrier and in the other case diarrhœa was only a minor feature.

### *Diet.*

At first the traditional *régime* (sweetened fluids, complex carbohydrate, complex carbohydrate *plus* protein, but without fat or residue) was adhered to fairly strictly, with intervals of two or three days between advancements. The rapid subsidence of symptoms following the exhibition of sulphaguanidine, and (considered equally important) the patients' ravenous demands for food, led to the telescoping of this sequence into progressively shorter intervals. In no case was the impression gained that any delay in recovery resulted from this increased dietary, and so it was decided to observe the effect of giving a fairly full diet from the outset. The only restrictions were that the unabsorbable residue was to be kept to a minimum and the fat content of the diet was also to be kept low. This latter restriction was imposed because in a number of instances patients reported that when fat was first consumed in any amount, even several days after completion of their sulphaguanidine course, abdominal colic recurred. No attempt was made to force such a diet on patients, so it might be argued that only the less severely affected were subjected to it; but this did not appear to be so in the seventeen acute cases in which it was taken. Indeed, three of these patients were among the most severely ill in the whole series, while the remainder belonged to the average in the severity of their illness. In detail, the increased diet consisted largely of soups, porridge, sago, rice, blancmange, junket, steamed puddings without suet, eggs, liver, brains, fish, minced meats, vegetable *purées*, tinned and stewed fruit, toast, bread, biscuits, small amounts of butter, *et cetera*. No fresh milk was available. All patients were given a full hospital diet on completion of their course of sulphaguanidine.

### *Fluids.*

The fluid intake and output of all patients under treatment was recorded. Every endeavour was made to ensure a minimum intake of 4·5 litres in twenty-four hours, and more when thought necessary, in order (i) to combat dehydration, although extreme degrees of this condition were not seen, and (ii) to ensure an adequate urinary output, thereby aiding the excretion of absorbed sulphaguanidine and also reducing the possibility of its being precipitated as crystals in the urine.

The figure of 4·5 litres was arrived at after consideration of a number of charts of fluid intake and output, from which it was observed that only when this figure was exceeded did the urinary output tend to rise *pari passu* with the amount of fluid taken by mouth. From these charts it was calculated that the average patient, who was in bed and whose diarrhœa had stopped, lost in the prevailing heat approximately 3·0 to 3·5 litres of fluid in a day from his skin and respiratory epithelium.

### *General.*

All patients were kept strictly in bed until their diarrhœa had ceased, and whenever possible, until their course of sulphaguanidine treatment was completed, though at times the number of patients made this impracticable. The number of stools passed per day by each patient during his whole stay in hospital was recorded; also at least one stool per day and in most cases all stools passed by each patient were inspected macroscopically and reported on by the medical officer or by a member of the Australian Army Nursing Service.

One gramme of sodium chloride was given to each patient three times a day, for despite the provision of fluids rich in salt, such as beef extracts *et cetera*, and the addition of salt to other foods, it was thought that chloride loss by sweating was so great that there was a real possibility of chloride depletion. It was found that the majority of patients tolerated salt in tablet form better than as a 0·125% solution in their drinking water.

## Complications.

### *Joints.*

No cases of typical post-dysenteric arthritis were encountered in this series, but five patients suffered from transient pain and tenderness in or around joints or in the region of the *tendo Achillis*. One patient complained of pain on movement of the left shoulder and left ankle joints three days after the cessation of sulphaguanidine treatment, and examination revealed slight local tenderness in the region of both joints with some swelling of the left ankle. Both joints had become normal five days later. Another patient developed pain in the right knee and both ankle joints a similar interval after his course of sulphaguanidine treatment, and examination revealed only local tenderness which subsided in two days. In the other three cases pain and tenderness in the region of one or both *tendines Achillis* was noted, in one case associated with a red, tender swelling over the tendon, which took four days to subside. The onset of this disability was in one case twenty-four hours, and in the other two approximately a fortnight after cessation of treatment.

### *Recurrent Diarrhœa.*

In fifteen cases a recurrence of low-grade diarrhœa (three to nine bowel actions a day) was noted after completion of the course of sulphaguanidine treatment. The

onset was after intervals varying from five to twelve days, but most usually after eight days. Macroscopic examination of the stools showed them to consist of liquid or semi-solid fæces, free from blood, but containing occasional flecks of mucus. Microscopic examination revealed no significant exudate. Sigmoidoscopic examination disclosed the presence of mucosal hyperæmia in association with the diarrhœa in seven of these cases. In every case repeated attempts were made to recover dysenteric organisms from the stools and rectal mucosa, but in no instance was it possible to do so. Nine of these patients were given a further four-day course of 65 to 70 grammes of sulphaguanidine, while to the remaining six no treatment was given other than rest and a light diet.

### Investigations on Completion of Treatment.

#### *Laboratory Tests.*

Cultures were attempted from at least one stool and one swab from the rectal mucosa of every patient in the series. Culture material was taken at least five clear days after the cessation of sulphaguanidine therapy. It was considered that in this interval sufficient time would have elapsed for the drug to be eliminated from the bowel and thus not inhibit the growth of *Bacterium dysenteriæ* if the organism was present. This assumption is supported by observations of Rantz and Kirby.[3] In all but eleven cases, however, the two or more specimens were examined after a longer interval. In 29 cases this period exceeded ten days for at least one of the specimens examined. In 30 cases more than the minimum of two cultures was attempted. In all, 143 stools and a like number of swabs were investigated from the 114 patients. The intervals between the completion of sulphaguanidine therapy and the attempts at culture are set out in Table II. In none of these 286 investigations were dysentery bacilli isolated at any time after completion of the initial course of sulphaguanidine treatment.

TABLE II.

| Intervals after which Cultures were Attempted. | Stools. (Days.) | Swabs. (Days.) |
|---|---|---|
| Shortest period after any sulphaguanidine course | 5·0 | 5·0 |
| Longest period after any sulphaguanidine course | 20·0 | 19·0 |
| Average period after any sulphaguanidine course | 7·0 | 8·5 |
| Longest period after initial sulphaguanidine course | 30·0 | 32·0 |
| Average period after initial sulphaguanidine course | 9·0 | 10·0 |

#### *Sigmoidoscopy.*

Owing to pressure of work, sigmoidoscopic examination was performed only in order to obtain swabs for cultural investigation and with the object of discovering whether the mucous membrane was macroscopically normal. (For this latter purpose no opinion was given unless the instrument had been passed a minimum distance of fifteen centimetres and the mucosa and rectal valves were clearly seen.) Hence the first examinations were not made until at least the fifth day after the course of sulphaguanidine treatment was completed, and thus many cases in which the mucosa was reported as being normal at this stage would probably have been so reported after a shorter interval. In spite of this the average interval before the finding of normal mucosa was reported in 101 acute cases was only 16·6 days after admission to hospital, and eight days after completion of the initial course of sulphaguanidine treatment. These times are similar to those reported by West[4] and Baker.[5] No patient was discharged from hospital until the sigmoidoscopic findings were normal.

### Comment.

1. The consistently negative bacteriological findings, the early return to normal of the mucosa, the rapid amelioration of subjective symptoms, the disappearance of blood from the stool and the subsidence of diarrhœa usually within twenty-four to thirty-six hours after the initial dose, together with the return to the usual number of normal stools per day after an average period of six days from the commencement of treatment, are convincing evidence of the efficacy of sulphaguanidine in the treatment and cure of Flexner type bacillary dysentery when used in the dosage described.

No comparable series of cases in which saline therapy was used can be presented; but the superiority of sulphaguanidine is so striking that there can be no suggestion of any false clinical impression. It is realized that a much more prolonged follow-up of the patients than was possible in this instance is necessary before any final pronouncement can be made as to the improvement in the relapse and carrier rate that will result from the use of sulphaguanidine. The fact that during the first four months after the completion of these observations no patient belonging to the series was readmitted to this hospital is at least indirect evidence in support of the contention that the number of relapses is likely to be small.

We wish to emphasize, however, the importance, in our view, of following in detail the course as described until the patient has had his normal number of normal bowel actions per day for two successive days, bearing in mind that an absence of bowel actions on any one day should not be considered normal. If this proviso is not fulfilled, most patients will receive a shorter course and smaller amount of sulphaguanidine than they would otherwise be given, and the possibility of complete cure will thereby be reduced. This point is further emphasized by the fact that dysentery bacilli could still be recovered from the stools of five of about a dozen patients examined during their course of sulphaguanidine treatment after amounts of 45 to 100 grammes had been given and when the acute symptoms had subsided. In each of these cases, although the number of daily motions was normal or nearly normal, the presence of blood-stained mucus or excess mucus had aroused suspicion that complete normality had not been attained. If attention had not been paid to the necessity in every case for making sure of both the normal number and the normal nature of the stools before ending treatment, several of these patients and probably a number of others would have had their sulphaguanidine treatment suspended while still harbouring *Bacterium dysenteriæ* in the bowel. As it was, the subsequent attempts at culture made at the end of the full course of treatment all gave negative results.

Some writers (West[4]) contend that sulphaguanidine has an active constipating action; this, however, is not our view. It was found that once a patient was given a diet containing unabsorbable residue and sufficient time had elapsed for the purged large bowel to fill again, it was extremely uncommon to encounter constipation of such degree as to require treatment. In every case the thirteen symptomless carriers treated by quite large amounts of sulphaguanidine continued to maintain their usual daily rhythm.

2. The recurrence of mild diarrhœa in a number of cases cannot be regarded as a relapse of the original condition in the absence of significant laboratory findings in any case. This view is supported by the fact that there was a somewhat more rapid subsidence of the symptoms of those patients treated solely by rest than of those to whom the further course of sulphaguanidine treatment was given. This is the reverse of the findings which might be expected in genuine relapses.

In our opinion this condition is merely a minor manifestation of the persistent colonic irritability so commonly seen in the pre-sulphaguanidine era.

3. Consideration of the average amount of sulphaguanidine given, the length of stay in hospital and the time required for the return of normal sigmoidoscopic appearances *et cetera* (see Table III) in those cases in which a diet containing complex carbohydrate, protein and a small amount of fat was given from the outset, in comparison with those in which a more orthodox diet was given, does not suggest that any harm resulted therefrom. This is in accord with our clinical impression.

TABLE III.

| Type of Patient. | Number of Patients. | Average Time in Hospital. (Days.) | Average Amount of Sulphaguanidine. (Grammes.) | Average Period of Sulphaguanidine Treatment. (Days.) | Average Time After Treatment Before Mucosa Normal. (Days.) | Number of Patients with Recurrent Diarrhœa. |
|---|---|---|---|---|---|---|
| Patients given usual diet | 84 | 21·5 | 104·0 | 8·1 | 9·0 | 13 |
| Patients given increased diet | 17 | 22·4 | 109·0 | 8·0 | 10·0 | 2 |
| Acutely ill patients | 101 | 21·8 | 104·7 | 8·1 | 9·2 | 15 |
| Carriers | 13 | 17·4 | 101·0 | 7·0 | 7·0 | 0 |
| Total | — | 20·9 | 104·3 | 8·0 | 8·9 | — |

We feel that we may safely conclude that in cases of Flexner dysentery of moderate severity, if efficient treatment with sulphaguanidine is given, no harm will result from the early presentation of a much more adequate diet than is usual. If this is so, then there are, of course, obvious advantages to be gained in the case of a patient who is already in need of nourishment rather than of a further period of semi-starvation. We cannot comment on the desirability of such a *régime* in severe dysentery due to Shiga or other types of *Bacterium dysenteriæ*.

4. Although, as stated above, these observations do not permit definite conclusions to be drawn as to the absolute cure rate to be expected with the treatment described, they do demonstrate that for practical purposes, in the case of epidemics or of troops in the field, such a course of sulphaguanidine treatment may be regarded as 100% effective.

It is suggested that when laboratory facilities are limited or not available, adequate criteria of cure after such a course of sulphaguanidine treatment as that described are: (i) the presence of normal rectal mucosa on sigmoidoscopic examination; (ii) the persistence of normal bowel actions after completion of treatment. Both these criteria should be fulfilled before a patient is discharged from hospital.

### Summary.

1. Bacillary dysentery as seen in the Northern Territory is briefly described.

2. The method and results of treatment in 114 cases of bacillary dysentery are discussed. Evidence of the efficacy of sulphaguanidine in the treatment of this condition is presented. The possibility is considered of giving a fuller diet than the standard when this drug is used.

3. Criteria of cure considered to be adequate after treatment with sulphaguanidine are enumerated.

### Acknowledgements.

We are indebted to Lieutenant-Colonel Lorimer Dods for his stimulating interest and advice and to Lieutenant Turton and her fellow members of the Australian Army Nursing Service for their assistance in recording the nature and numbers of stools passed by the patients. Our thanks are due to Brigadier N. H. Fairley and to Colonel E. V. Keogh for helpful criticism.

Major-General S. R. Burston, Director-General of Medical Services, has kindly given permission for publication.

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## THE OPENING OF BIOCHEMICAL AMPOULES: AN IMPROVED MECHANICAL METHOD.

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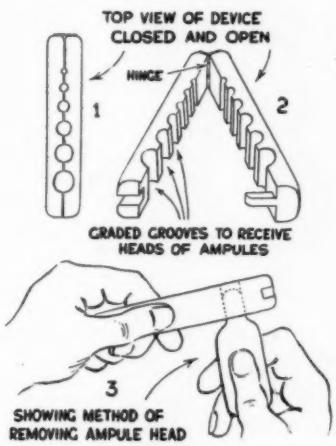
THE present method of opening ampoules containing vaccines and biochemical products may be time-consuming and imperfect. In a more convenient device used by the writer (Figure I) there are available a graded series of cylindrical receptacles which firmly embrace that portion of the ampoule which extends beyond the neck. The device opens like a nut-cracker and the ampoule head is placed in the graded receptacle which firmly grasps it without free play. The body of the ampoule is then gripped with the right hand and gently snapped off by the same action as is used with the manual method. In principle the device simply replaces the finger grip on the head of the ampoule by a moulded vice.




The type of device herein described could, with advantage, be replaced by a metal one, based on the more convenient forceps principle.

It appears justifiable to assume that the diverse types of ampoule are the result of the different approaches made by the manufacturers to aid the, at present, imperfect manual method used in broaching ampoules. In the case of emergency remedies, such as pituitrin, the thin needle-like projection offers no difficulty. On the other hand, with one brand of nikethamide, a blister-like neck often bursts on the lightest contact with a file, and a mosaic fracture, with contamination from the label and wastage, is not uncommon. In yet other circumstances the hard quality of the glass has precluded the breaking of a large non-tapering type of ampoule after five minutes of resultless filing.

The device suggested should allow of standardization to a single type of ampoule constructed of firm non-resistant glass. In this, the V-shaped constriction could be replaced by a small tubular section which would act as a true neck between the head and body of the ampoule. Filing could then probably be dispensed with. At present it is necessary in most cases, when using the device, to carry out circumferential filing with a good file previously. It is to be remembered that glass fractures with some degree of torque and the manual grip of the body of the ampoule allows this to have play. A device in which one member held the body of the ampoule and another was used to lever and break the neck, proved too rigid and was less efficient than the single device described.

Apertures which range from one-fifth to one-half or three-quarters of an inch, in a series of five or six apertures, appear to meet all requirements, including the large penicillin ampoule of 20 cubic centimetres capacity. The latter is constructed of thick glass and has a head half an inch in diameter. This ampoule, the opening of which by the manual method consumes no little time and energy, was broached with ease by the above device.

Should any medical practitioner or institution desire to acquire the device, it is made by a semi-invalid wood worker, whose address will be forwarded to the inquirer.

# Reports of Cases.

## CEREBELLAR DEGENERATION WITH EPILEPSY.

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COPIES of Australian medical journals going back to 1856 are to be found on the shelves of the medical school library; but a perusal of them will reveal but few articles on cerebellar disease (say, nine up to 1910), and still fewer in which the histological findings are included—in fact, scarcely one. Cerebellar findings including gross loss of Purkinje cells in the brain of a young female epileptic sent to this laboratory reminded us of an article by Thorpe which appeared in *Brain* in 1935; it dealt with two siblings, both epileptic, both with cerebellar signs, and included the neuropathological investigation of one of them. The publication therefore of a similar case may help to remove this deficiency in our literature.

### Clinical Record.

The patient, the subject of this report, was admitted to a mental hospital in 1934, when aged ten years, and died of pneumonia in 1942, at the age of eighteen years. A sister eighteen months younger and both parents are alive and well, and the family history is clear of epilepsy or any nervous disease. From a normal pregnancy and birth the patient's progress was apparently normal till the age of six years, when *petit mal* developed. The attacks were numerous and urine was always passed. By her eighth year she was having thirty to forty seizures a day, in spite of a varied medical treatment; for instance, she had her appendix removed, she was treated for worms, her skull was radiologically examined, with normal results, and the Wassermann test was applied to her serum, no reaction being obtained. At the age of nine years she lost the use of her legs; about this time, too, her speech became difficult, and *status epilepticus* at times intervened. Apparently her mentality depreciated from this on. At the age of ten years she continually emitted a crying sound, she could neither walk nor feed herself, and her speech consisted mostly of "yes" or "no". She was faulty in habits and had about forty seizures a month. Examination revealed spastic paraplegia and exaggeration of all reflexes. She remained a "chair" patient, growing thinner and playing with dolls.

The nursing staff bear witness that her mental make-up and intelligence were better than appeared on the surface, in that she knew her parents and even the visiting days, becoming emotional if her visitors did not arrive. The menarche occurred at the age of thirteen years, but her menstrual periods were always irregular and her secondary sexual characteristics were childish and undeveloped. In 1939 her bodily health was poor, and in November, 1941, she could recognize her name but could only say "yes" and "no", was unsteady on her feet and fell about when not supported. She died in 1942. The post-mortem examination revealed only lobar pneumonia. The general impression was that she was a spastic quadraplegic with rigidity and contractures, and the clinical diagnosis was diffuse cerebral sclerosis; the cerebellar findings were quite unexpected. Physical disability, especially if it causes aphasia and lack of control over the sphincters, is at times taken by general practitioners and physicians as a sign of idiocy in children and of profound dementia in adults. The mistake will often be made again in the future.

### Anatomical and Pathological Findings.

The brain, which was received in 10% formalin solution, had clear pia, a clearness which at times masks somewhat increased thickness. It was well shaped but small, weighing 1,020 grammes instead of the normal 1,205 grammes. It did not feel unduly sclerotic, and the gyri appeared well developed. The cerebral hemispheres weighed 930 grammes, the pons and medulla 21 grammes, and the cerebellum 69 grammes (normal, 129 grammes). The ratio of the parts, if the whole brain is taken as 100%, was respectively 91%, 2% and 6·76%, as compared with the normal figures of 87%, 2% and 11%. Even in view of the small cerebrum, the cerebellum therefore was undersized. These figures may be compared with those of the "N" family of subjects of familial cortical cerebellar atrophy, in which the figures were 90%, 2·3% and 7·8%, the whole brain weighing 989 grammes. Transverse and vertical measurements of the brain stem (pons and medulla) were consistent with these weights. Further, when sections of the cerebellum were cut through the vermis, the culmen and clivus looked atrophied, the sulci were more open and the folia more shrivelled than normal, and the overlying pia was thick over this region—a finding commonly noted in illustrations of these pathological states. The dentate nucleus looked normal, and microscopically its neurones and most fibres near them appeared healthy.

#### *Methods of Treatment.*

To compare this brain with those in other articles on cerebellar disease, it was deemed advisable to include for examination parts of the cerebrum as well as the pons, medulla and cerebellum. Paraffin and frozen sections therefore were taken from the frontal, occipital and Rolandic areas, from the hippocampus, from the caudate and other central nuclei, and from the pes, pons and medulla, including the top of the spinal cord. From the cerebellum sections were taken from the central lobule, the culmen, the clivus, the *tuber valvulæ*, the postero-superior and inferior lobules, the *lobulus gracilis*, the uvula, the pyramid, the biventral lobules, the tonsil and the anterior and posterior crescentic lobules.

The stains used included hæmatoxylin and eosin, iron hæmatoxylin and Van Gieson, Weigert-Pal, Mallory's phosphotungstic hæmatoxylin and his triple stains, *Scharlach-R*, and the silver methods of Cajal and Von Braunmuhl; the last-mentioned proved most reliable and valuable.

#### *Pathological Findings in the Brain.*

A small but well-defined degree of arteriosclerosis was present throughout the whole brain, and also a degree of glial cell hypertrophy in the molecular layer, in the subcortex, in the various nides down the brain stem and iter, in the medulla, and specially in the olives and dentate nucleus and cerebellar white substance and round its vessels. The cerebral pia was moderately thickened, but in no wise adherent or infiltrated. A casual glance at the cerebral neurones suggested a somewhat juvenile appearance; but examination of silver preparations revealed good processes. However, these are present even in infant neurones. No decision could be reached on this point; the neurones were otherwise healthy. But the most remarkable phenomenon was a mantle of woolly glia on the outside of the molecular layer, from one-fifth to one-tenth of its breadth and embracing every gyrus noted. It did not resemble subpial felting, and the Mallory stains showed it

up readily. The superficial vertical strands of glia proceeding from the pial aspect of the cerebellar cortex—the most extensive we have experienced—may have been an expression of a similar gliosis as well as of a replacement glia where Purkinje cells were deficient. Except the olive cells—which, however, showed up better in frozen sections—the extracerebellar neurones were healthy, and the obvious normality of the cerebellar peduncles, the pontine neurones and transverse fibres, and all the myelinated fibres about the

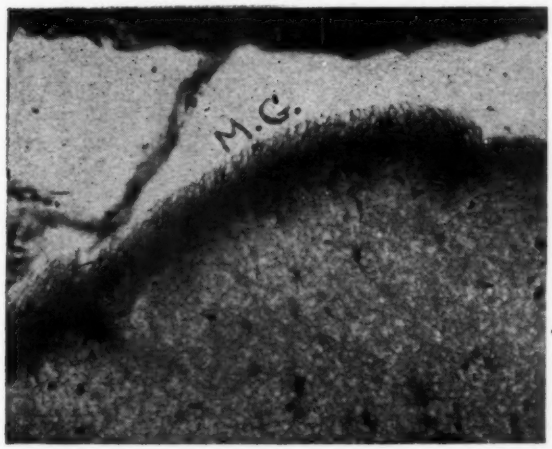


FIGURE I.
Note the peculiar mantle of glia overlying the cerebral cortex (M.G.), not firmly attached to the slightly thickened pia-arachnoid. (Mallory's phospho-tungstic hematoxylin stain; × 200).

olives, olivary-cerebellar and arcuate fibres and tracts from the cord, as revealed by Weigert-Pal preparations, ruled out such syndromes as the superior cerebellar-red nucleus, the olivo-pontine-cerebellar type, Friedreich's and Marie's types, and the olivo-cerebellar type. The condition revealed therefore was an intracerebellar lesion.

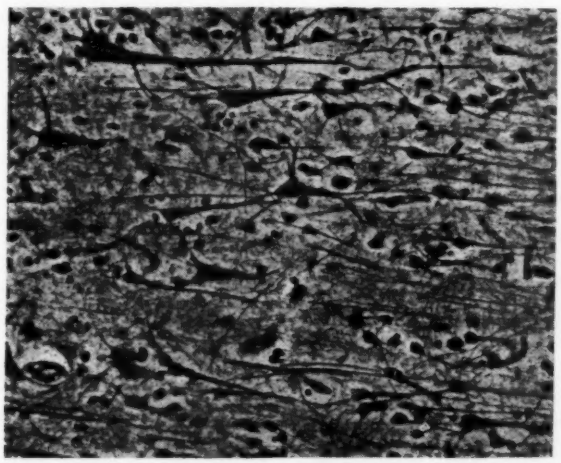

FIGURE II.
Silver impregnation of neurones in the ascending frontal convolution, which seem well developed and healthy. (Cajal's method for frozen sections; × 200).

*Pathological State of the Cerebellum.*—The cerebellum was undersized (weighing 69 grammes instead of the normal 130 grammes); the superficial pia over the superior vermis near the culmen and clivus was thickened, and examination of sections revealed some local *status spongiosus*. Microscopically one or two folia were knocked out here and the molecular layer also was particularly narrowed, its horizontal fibres being few and resembling corkscrews. But the main characteristic was the almost complete absence of any healthy Purkinje cells with cytoplasm, Nissl bodies, normal nucleus and antler, shape and position. In place of this the low power of the microscope revealed nothing; only with higher powers might one observe "squibs" of cells in their place, smaller than the Golgi type II cells which, as usual in these conditions, look more plentiful and conspicuous. Even the hypertrophied Bergmann glial cells at times out-

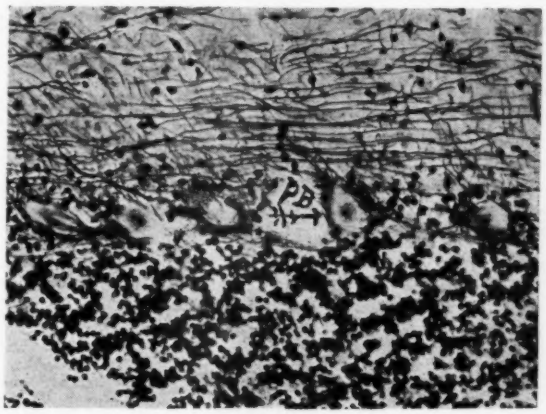


FIGURE III.
Same silver stain. Nearly normal area of cerebellum (central lobule), where some nine healthy Purkinje cells with nuclei peep through nearly normal and sectioned baskets (P.B. and arrow). (× 200.)

range in size the Purkinje remnants. These Bergmann glial cells send thickened, ascending fibres toward the pia and at the tips of the folia their cell bodies forming a kind of palisade are separated from the level of the Purkinje neurones by a space. These conditions are, however, common in arteriosclerosis. The molecular layer glia (always of greater import in the cerebellum than in the cerebrum) is here represented as a thick mantle of matted, but on the whole vertical,

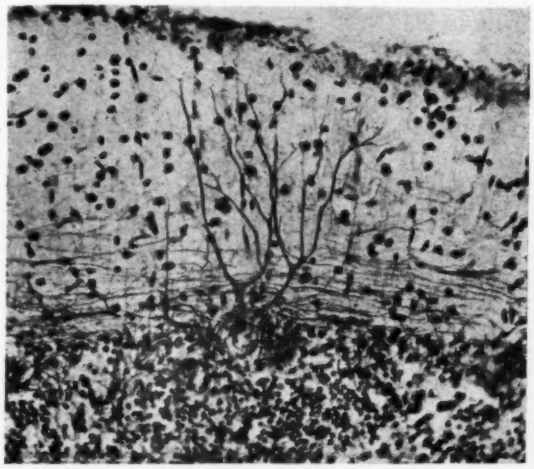

FIGURE IV.
Same silver stain. Only two normal Purkinje cells with antlers visible, though there are plenty of baskets.

fibres pointing inwards. Other cells besides the basket neurones are specially conspicuous in this layer. Although a general survey was made in regular order over the vermes and the other areas enumerated, no special anatomical areas of lesions were noted; in occasional patches somewhat better Purkinje cells were seen, a few relatively normal. An area in the central lobule seemed the best, for here we

came on a number of rows of six to nine Purkinje cells which were quite normal. On the other hand, large areas such as the anterior crescentic area *et cetera* averaged less than two recognizable Purkinje cells per folium. With iron hæmatoxylin-Van Gieson and silver staining methods normal brains gave figures like 35 to 40 Purkinje cells per folium and a like number of baskets. In this case, while the baskets

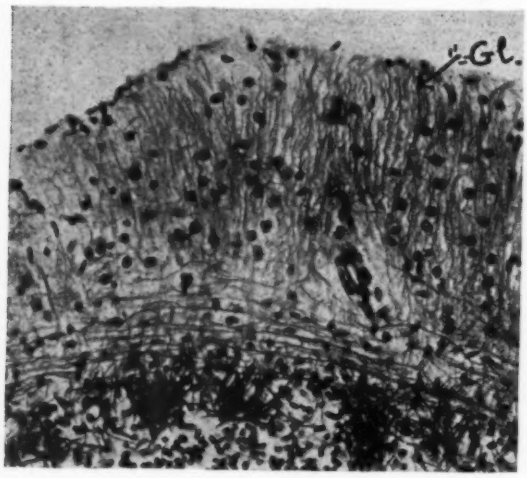


FIGURE V.

Same stain. Plenty of conspicuous empty baskets, black; horizontal fibres in plenty just above, and still higher, coming down from the pia, a thick felting of vertical glial fibres (Gl.). (× 200.)

often averaged 28 per folium, two was a fair number for the Purkinje cells. As is common in these states, the basket system stands out conspicuously. The basket cell bodies are readily noted, their horizontal fibres (except where the molecular layer is particularly thinned or narrow, for

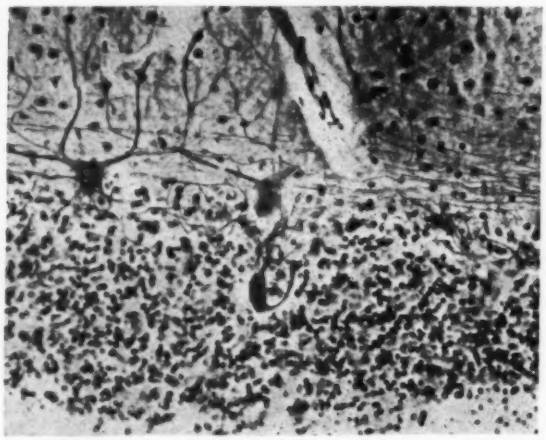

FIGURE VI.

Beneath the corbs of two of these three Purkinje cells note peculiar fusiform bodies (torpedoes), one showing the recurved process and in the granular layer. (Von Braunmuhl's silver stain; × 200.)

example, under a thickened pia) are plentiful and thick, and the baskets themselves outstanding. Possibly this can be thus explained. The healthy fat Purkinje cell is surrounded by and fills a basket, and so examination of a section shows the neurone yellow and with the black side of the basket on either side. When the Purkinje cell contracts to a "squib" the basket falls in, and one tends to have a bundle of faggots as it were. When it is considered that the whole cerebellum except the glia is probably at least starting to degenerate, the basket fibres themselves are almost certainly swollen and therefore conspicuous. They are easily counted. The granular layer is even and regular; it is difficult to determine whether it is thinned or not, and the white centre at least is plentifully supplied by myelinated fibres and with axis cylinders revealed by silver staining

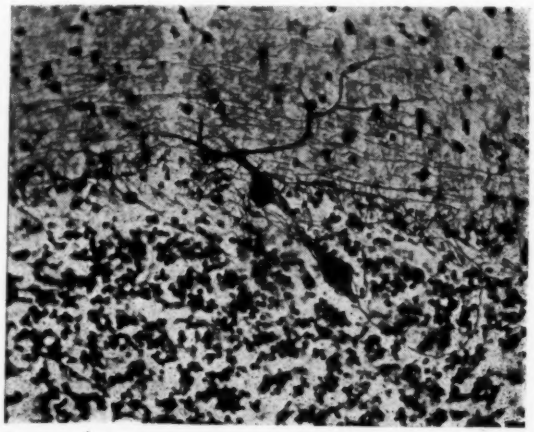

FIGURE VII.

Same type of section and stain. Good Purkinje cells showing axis cylinder with fusiform swelling thereon (torpedo), ending in a distinct fine fibre and branch, which soon curve upwards and to the right. (× 250.)

methods. The Golgi type II cells including the epithelioid cells, in spite of their noble proportions, are not readily shown up; but their cell bodies appear healthy and their nuclei good. So far these pathological findings denote the centrifugal type of cerebellar degeneration, and are often found in the heredo-familial types. We have now to include other phenomena pertaining rather to the centripetal type, more usual in cerebellar changes in common diseases. Under

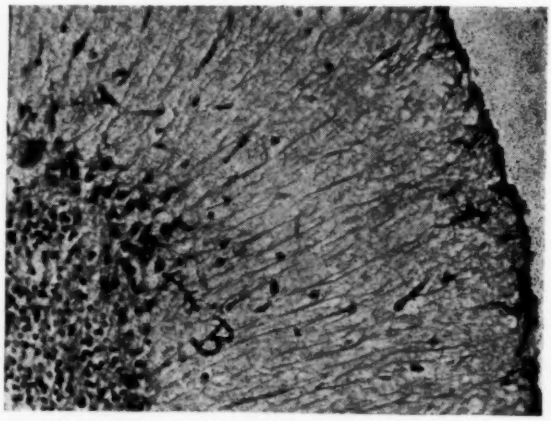


FIGURE VIII.

The Bergmann glia of the molecular layer may possess large triangular cell bodies (B) when hypertrophied, larger than the granule cells beneath them, even than atrophied Purkinje cells. Their fibres like ribbons ascend towards the surface. (× 250.)

the corbs of many Purkinje cells in the granular layer many fusiform swellings were noted, and the downward fibre proceeding from them commonly gave off a U-shaped reascending branch. Some of these swellings could be directly traced to a Purkinje cell—that is, they were torpedoes. But illustrations from Bouman and Bok's excellent brochure would have them all torpedoes; according to the Wertheims they are rather an expression of the centripetal types. It

Rupert McDowall

is to be presumed that pure types are not always met with. Torpedoes at times are associated with thickened antlers, which are then said to be "cactus like". If all the cerebellum examined is considered, it was calculated that probably more than 85% of the Purkinje neurones were unrecognizable, and sections prepared in various ways were used as checks.

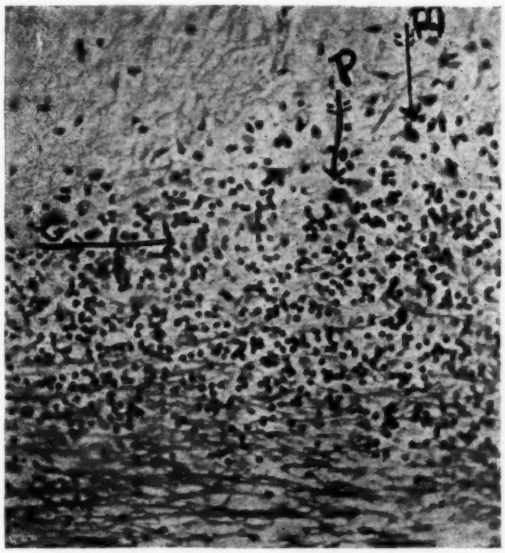


FIGURE IX.

Hypertrophied Bergmann glia (B), conspicuous Golgi type II cell (G) and atrophied Purkinje cell (P) are much of a size. (Iron hæmatoxylin-Van Gieson; × 250.)

### Findings in Thorpe's Cases.

Both of Thorpe's subjects were males and epileptics; one was certified insane at the age of twenty-five years, developed signs of cerebellar disturbance at the age of forty-one years, and died at the age of forty-six years, after a life of epilepsy; the other began to have epileptic fits at the age of nineteen years, was certified insane at twenty-five years, and developed signs of cerebellar disturbance at thirty-seven years; he was still in hospital when the account was written. *Post mortem*, the brain was normal, save that the pons, medulla and cerebellum weighed 130 grammes instead of the normal 170 grammes. Atrophy was most pronounced on the anterior and superior surfaces especially of the vermes, and of the semilunar and quadrate lobules, so that great exposure of the middle cerebellar peduncle was present from folium shrinkage round the great horizontal fissure. Also in the spinal cord a deep lateral groove was present. Great loss of Purkinje cells was noticed and severe degeneration of the rest in the superior vermis and quadrate lobule. The molecular and granular layers were narrow and poor in cells, amyloid bodies were abundant, and in places some *status spongiosus* was found. Weigert-Pal staining methods revealed loss of myelin fibres in the white centre. No signs were seen of inflammation or arteriosclerosis, and the intrinsic nuclei were healthy and the olives were normal and had no excess glia. Save for scattered degenerated Betz cells, the cerebral neurones were healthy. Thorpe quotes Matthew and Berhand, who suggest that the longer folia and deeper sulci of the vermis predispose them to degeneration, possibly on analogy with the hippocampus, which is subjected to fluid pressure on several sides. He puts the question: "Does the fit cause the cortical cerebellar degeneration?" He also quotes Spielmeyer's statement that in over 80% of epileptics *cornu ammonis* atrophy and loss of Purkinje cells are present, probably on an angiospastic basis, and both these areas have vessels long and tortuous and but few collaterals and capillaries.

### Some Precautions.

Care should be taken to cut sections vertical to the surface and across the lines of the sulci. This procedure gives well-displayed Purkinje cells. This cannot be done when the dentate nucleus is included; with the latter some white centre should be included. Not only vascular and glial and myelin states may often thus be seen which have not proceeded further peripherally, but now that more attention has to be given to acute and chronic demyelinating states in young children, the value of being able to demonstrate the rich galaxy of all kinds of cells almost entirely limited in the cerebellum to its white matter may throw a flood of light on an obscure and large *centrum ovale* demyelination, which may have proceeded to liquefaction. Mallery's triple stain shows these cells graphically. Mullendorff, quoting Cajal, allows Purkinje cells to assume normally positions both above and below the common plane, and to be of various sizes and even to lie sideways; still, usually normal Purkinje cells will be found regular in position and with most of the normal attributes.

### Comment.

A plea is put forward for more regular routine examination of the cerebellum. In the present case such examination drew attention to a loss of cerebellar neurones but twice met with before in thirty-six years, and on these two occasions within the last three years. Three times lately in children it has helped to establish the identity of a cerebral state, and the cerebellar reaction seems to represent a less developed stage. Naked-eye appearances are rarely so pointed as in the recent instance in which a normal looking five months old baby's brain was found to have a cerebellum weighing about twelve grammes.

### Summary.

The neuropathological findings in a female, aged eighteen years, an epileptic of some twelve years' standing, has been presented. Peculiar glial mantles covered both cerebrum and cerebellum, and examination of the latter revealed widespread atrophy of the Purkinje cell system with preservation of the other neuronal systems—an example of the cerebellofugal type of cerebellar atrophy. Reference has been made to similar neuropathological findings in an epileptic exhibiting similar clinical signs, the rarity of cerebellar pathological states in epileptics is stressed, and the value of these examinations is suggested.

### Acknowledgements.

Acknowledgements are due to Professor W. K. Inglis, Department of Pathology, University of Sydney, and to Dr. E. Sydney Morris and Dr. Grey Ewan, of the Mental Hospitals Department of New South Wales; also to Mr. Woodward Smith for his photomicrographs and help; and to Miss Davison, B.Sc., for some of the sections.

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G. Holmes: "An Attempt to Classify Cerebellar Disease, with a Note on Marie's Cerebellar Ataxia", *Brain*, Volume XXX, Part 4, 1907, page 548.

Mullendorff: "Handbook of Anatomy", page 765.

L. Bouman and S. T. Bok: "Histopathology of the Central Nervous System."

## Reviews.

### OSLER'S MEDICINE.

OSLER'S "Principles and Practice of Medicine", first published by the late Sir William Osler as far back as 1892, evidently still retains very widespread popularity under the present editorship of Professor Henry Christian, for the fifteenth edition now under review has appeared only eighteen months after the fourteenth.[1]

Perusal of the new volume reveals abundant evidence of careful revision, and anyone proposing to purchase a copy may rest assured that no worthwhile new method of diagnosis or treatment established since the last edition went to press has been omitted. If he has any complaint to offer it will, we think, be to the sheer weight of letters he has to support, for what began as a handbook has gradually grown to be a weighty tome of 1,500 pages comfortably

[1] "The Principles and Practice of Medicine, originally Written by Sir William Osler, Bart., M.D., F.R.C.P., F.R.S.: Designed for the Use of Practitioners and Students of Medicine", by Henry A. Christian, A.M., B.D., LL.D. (Hon.), Sc.D., Hon. F.R.C.P. (Can.), F.A.C.P.; Fifteenth Edition; 1944. New York: D. Appleton-Century Company Incorporated. Sydney: Angus and Robertson Limited. 9¼" × 6¼", pp. 1528. Price: 63s.

studied only on a book-rest or table. It would, we believe, be a popular innovation if the next edition appeared in the form of two smaller volumes.

In his introduction the author admits the justness of the oft-repeated criticism that there has been an increasing tendency in modern clinical teaching to become so intrigued with the demonstration of laboratory procedures and complex techniques for investigating the physical aspects of a patient's disease that the fact that he has a personality has tended to be more and more overlooked. To correct this undue emphasis on the physical as opposed to the psychic aspect of medicine, Professor Christian suggests that the student at the very outset of his clinical training should be made fully conversant with the emotional and functional aspects of ill-health. So far we fully concur, but we doubt if the objective has been achieved by the simple expedient of making the omega of the earlier editions the alpha of this and by conducting the clinical neophyte to his new field of endeavour through that thorny and difficult maze labelled functional diseases of the nervous system with its bewildering sign posts neurasthenia, anxiety neurosis, psychoneurosis, hysteria, *et cetera*.

We believe that the situation would be better met by a simple introductory chapter designed to integrate pre-clinical training in anatomy, physiology and pathology with an appreciation of the great significance of individual psychic background. It should aim at developing a broad understanding of the fact that physiological reactions that can be postulated with reasonable accuracy in laboratory animals and normal individuals may entirely lose their significance in the presence of psychic disorder, and that practically every sensory motor or visceral disturbance normally indicative of a pathological defect at some point in the afferent-efferent arc may be more or less closely simulated through psychic influences acting on the particular cerebral centre involved. If at the very outset of his clinical training the student becomes fully aware that personality is as individual as are finger prints and that physical and mental environment not only has a very important bearing on the symptoms and course of disease, but, acting on certain backgrounds, may so affect functions and activities as to suggest pathological changes that are non-existent, he can well leave the classification of these particular psychic disorders concerned till a much later stage in his training. This, however, is but a minor criticism of a really excellent book that presents a thoroughly comprehensive survey of the principles and practice of medicine as known today. Knowledge has become so extensive that even with 1,500 pages at his disposal, Dr. Christian has been compelled at times to be rather more didactic than he would obviously have wished, while at others he has been forced to compress his accounts of some of the rarer diseases into quite thumb-nail sketches; he has, however, offered full compensation in such cases by supplying footnotes giving references to sources where fuller information can be obtained.

We have been discussing the book mainly from the student's point of view, but it is much more than a student's handbook and many general practitioners will find it full of interesting and stimulating reading and a valuable addition to their libraries. It would, perhaps, be wise to warn the Australian student that here and there he will be introduced to therapeutic measures rather bolder than those of which his examiner may approve, as, for example, when he is told that twenty grains of quinine hydrochloride is the appropriate intravenous dose for an adult with cerebral malaria, to be repeated in an hour or so if symptoms do not improve, or again that four to five milligrammes is the oral dose of ergotamine tartrate in migraine.

## PREVENTIVE MEDICINE.

IF Professor Harvey Sutton has not given us an Australian text-book of hygiene, he has at least, in his "Lectures on Preventive Medicine", come very close to doing so.[1] In his preface he disclaims the title of "textbook" or "handbook" for his work, but expresses the hope "that in addition to providing essential studies for students" . . . the book "may revive in the 2,000 and more practitioners who have passed through the course . . . a renewed interest in the preventive aspects of medicine, and awaken in the Australian profession generally a greater appreciation of the health needs of our own people". He has at any rate succeeded, without doubt, in producing a volume that should be of far greater use to the Australian medical officer of health, particularly the part-time officer, than any similar work written overseas, excellent though most of the latter be. Considered as a substitute for lecture notes for students, this book no doubt fulfils all requirements, but in the light of its wider objective it has certain shortcomings, but many merits.

The author departs, refreshingly, from the usual stereotyped arrangement of subjects. After a brief introduction, mainly historical, he divides the volume into four chapters, each embracing several sections. His first chapter is entitled "Human Life History", the second "Environment", the third deals with communicable diseases, and the last and shortest on public health administration. In addition there are eight short appendices. There is a wealth of statistical information given in numerous tables, and as Australian statistics are used (unless the context demands overseas figures) these add greatly to the interest for the Australian reader. For it must be said that this is essentially a book to read, not merely to use as a work of reference or "cram book". Some sections, unfortunately and perhaps unavoidably, still carry traces of lecture note summaries, but in many others the author gives rein to his own racy style. Among these, to mention only a few, are the sections on school medical inspection, housing and town planning, and infectious disease. The section on vectors is extremely well illustrated.

One fault in the arrangement, perhaps born of a desire to economize in paper, is that the differentiation between the various sections is not always clear. The last chapter, that on public health administration, does not appear to be up to the standard of the rest of the work. It embraces but six pages, and the information given refers mainly to New South Wales only. Although health legislation in all the States is based on the same general principles, there are considerable variations in detail between the several States. The chapter could have been made of considerably more use to health officers in other States (and in some States about 50% of the country practitioners are part-time health officers) by dealing with these variations in more detail, and also by including some greater reference to the activities of the Commonwealth Health Department and its relation to those of the States. Other notable omissions are that virtually no reference is made to the work and duties of the non-medical health inspectors, both departmental and municipal, who play a very important part in the administration of the various health and allied acts; to the supervision of foodstuffs, other than meat and milk; and while full details are given as to methods and technique of vaccination against smallpox, no corresponding details are given as to methods adopted for mass immunization against diphtheria. In the section on disposal of wastes the author is surprisingly brief on the subject of septic tanks, or small sewage installations, which can play such an important part in the amenities of rural life. We think that some of the space devoted to detailed consideration of vitamins (thirty-nine pages) could have been given to these other topics.

There is an apprehensive note in the preface. ("One is only too aware of the risks that await the newly born. Someone has said 'O that my enemy had written a book'.") The author might have written, "I have thrown a boomerang", but indeed these defects are mentioned only because it is to be hoped that the issue of this volume will be so successful, that the author will be emboldened to amplify it to a "Text Book of Preventive Medicine and Hygiene", and to incorporate in it some of the subjects which he has omitted from the present volume.

As so much of the area covered by Australia and its dependencies lies in the tropics, it is not surprising that the author has given considerable attention to the problems of tropical medicine and hygiene. He has also evidently had in view the probability that many of his undergraduate readers would before long be medical officers in one or other of the services. There are no separate sections on "Tropical Medicine" or "Military Hygiene"—these subjects permeate the whole work and add considerably to its value.

The volume is well indexed. The type is clear. In most of the statistical tables emphasis is placed where needed by the use of heavier type than the rest of the table, a useful device. In spite of its 658 pages the volume is convenient to handle.

Altogether it is a book which every medical practitioner who has any interest in the preventive aspect of medicine should add to his shelves. He will find it not only an extremely useful work of reference, but a most readable and inspiring work.

[1] "Lectures on Preventive Medicine", by Harvey Sutton, O.B.E. (Mil.), Lieutenant-Colonel, A.A.M.C. Reserve, M.D., D.P.H. (Melbourne), B.Sc. (Oxon.), F. Roy. San. Inst., F.R.A.C.P.; 1944. Sydney: Consolidated Press Limited. 8½" × 5½", pp. 676, with illustrations. Price: 27s. 6d.

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SATURDAY, APRIL 28, 1945.

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## THE CARE OF THE AGED.

Not many people can say with Robert Browning:

> Grow old along with me!
> The best is yet to be,
> The last of life, for which the first was made.

Had more people this hopeful, this healthy, outlook, they would in their latter days enjoy the serenity, even if they were not able to put into words the wisdom, of Cato the Elder expressed by Cicero in his "*De Senectute*". This would be possible for them if the passing of the years had not taken such toll of their bodies that life had on that account become a burden. Too often the words of the Psalmist apply when to his statement, "The days of our years are threescore years and ten", be added, "and if by reason of strength they be fourscore years, yet is their strength labour and sorrow; for it is soon cut off, and we fly away". To insist that the process of growing old is not dependent merely on the passage of the years is to stress the obvious. All practitioners of medicine, and indeed all observant people in the community, can point to persons who appear to have grown old before their time and to others who talk of being, say, "ninety years young" and display a mental vigour that many another at the three-score-years-and-ten level would envy. Though from one point of view it can be held that the boy is the father of the man, life's adventures may be so varied, the changes so kaleidoscopic and far-reaching, that the boy, had he the chance, would often not recognize his own offspring. For this changes in the mental sphere are largely responsible, but the most constant changes take place in the body. E. V. Cowdry last year pointed out in an address[1] on the physician's opportunity to help older people, that "the senile is not simply an old man". This remark he quotes from someone else, but he goes on to observe for himself that the senile:

> . . . is practically another person gradually reconstructed in the same general form. . . . Certainly most of his structural materials have been replaced, some of them repeatedly. The whole trend of recent studies . . . is to show the wide extent of this replacement. It is true that some individual cells live for a long time, but we may look to the time when replacement of their constituents will also be proved. Perhaps the greatest burden is failure regularly to get rid of aged elastic fibers and systematically to replace them with new ones.

The senile is also of smaller size, owing to atrophy. Some of his tissues are made up of fewer cells (nervous system), others show localized hyperplasia (skin), while still others are hypertrophied (prostate, arteriolar walls). He works with a different background of experience under higher blood pressure and at a lower metabolic rate. He is handicapped by decreasing efficiency of homeostatic mechanisms and by maturing nutritional deficiencies and excesses and probably by tissue ischæmia. A new concept is the idea that his tissues do not merely dry up with the advancing years, but tend to become waterlogged.

The care of the aged may be viewed from two standpoints. Medical practitioners as such are concerned chiefly with the aged and their diseases. This subject was discussed in these pages in the issue of April 17, 1943, when it was concluded that, although the diseases of old age might conveniently be described by the term geriatrics, the care of the aged should be in the hands of the family doctor. Closely allied with this medical point of view is the question of the teaching of geriatrics to the medical undergraduate student. This is dealt with by Cowdry in his address and we do not intend to discuss it at present. The other point of view has to do with the general disposal of aged people, where they shall live and who shall care for them when they are no longer able to live without some kind of personal attention. This is an urgent problem in Australia at the present time and will become more urgent as time goes on. This increasing urgency was made clear in our discussion of April, 1943, when figures were quoted to show that the number of old persons in the community is steadily increasing.

At what stage an aged person will need the help of someone else in the ordinary routine of everyday life will depend on how long his bodily health and mental vigour remain unimpaired. An aged person, in spite of the physical changes described by Cowdry, may retain satisfactory health and with it a large measure of independence, but either body or mind may begin to fail independently of the other and both may fail together. Thus the degree of dependence may be of many different grades. It may be stated at this stage of our discussion that dependence should be adequately met and independence of spirit encouraged. Unfortunately many persons mature, go through an active life and reach advanced years without having created any reserves on which they can draw when their current energy fails. They are the kind of persons who have a vacant mind or an itching restlessness, so that they cannot be left to their own devices, but must have always some entertainment or amusement. Among them are querulous husbands, petulant wives and parents over-possessive of their children. Preventive measures are as necessary to combat boredom in old age as is diphtheria antitoxin to keep children safe from the ravages of the Klebs-Löffler bacillus. There is no doubt that the hobbies and intellectual pursuits of early life provide a pattern on which an aging man or woman can build a resting place of at least partial contentment. It may also be pointed out in passing that another way by which old people may be helped in their daily lives is by the making of arrangements that will give them something regular to do, some feeling of responsibility. Some small daily duty allotted to them and to be done by no one else will create a feeling of usefulness.

[1] *The Journal of the American Medical Association*, June 10, 1944.

Such tasks can be found without a great deal of trouble in any private home or institution. A suspicion that they are a burden to others may be fatal to the well-being of the aged and as much cruelty may be inflicted on them by thoughtlessness as by deliberate neglect. The kind of help that can be provided for old people who stand in need of it varies with their financial position. There are three grades, as there are in the arrangements under which medical practice is today conducted. There are no available figures to show how many of the old people of Australia fall into the three categories. Cowdry gives some interesting figures for the United States of America. In a survey made by the United States Social Security Board 3,480,000 persons of one group were dependent on friends or relatives; 1,590,000 were supported wholly or partly by public or private social agencies; 2,746,000 were financially independent, living on pensions, annuities or savings. Persons of independent means in normal times can provide for themselves by obtaining the services of trained or unqualified attendants. Wartime conditions, when nursing and domestic assistance is practically unobtainable, have made the lot of these people very trying and many of them have had to seek institutional help. Persons with no means or with very slender means are in this country cared for in State-owned institutions or in those run by churches or other organized bodies. Between these two there is a large body of persons who try to pay their way, and when they cannot find a haven with relatives or friends, seek admission to what is known as a rest home. State-owned institutions are subject to inspection by governmental authorities, and means are available for the securing of a decent standard of living and attendance and for the investigation of complaints or reputed injustices. For so-called rest homes run by enterprising, and in some instances one might almost say parasitical, private owners, there is no inspection. Many of these places are overcrowded, their equipment and general furnishings are quite inadequate, sympathetic treatment is abandoned for callousness and the fees charged are inordinately high. This is nobody's business and large numbers of the aged in the community suffer untold physical hardships and anguish of mind. This is a matter that should engage the immediate attention of the health departments in the several States.

## Current Comment.

### THE RESULTS OF ADEQUATE CONTROL OF DIABETES.

THE close supervision of diabetics has, we believe, not only extended their period of useful life, but has decreased the complications of the disease that otherwise might have threatened their comfort and safety. Russell Richardson and Morris A. Bowie have published a study on 100 patients who have had diabetes for ten years or more and who have been under constant care in one clinic for a period of at least ten years.[1] Special observations have been made of the general metabolism, and in particular the circulatory system and the eyes, since these are so vulnerable in diabetics. For the past fifteen years these patients have taken a diet in which the fat content has never exceeded 110 grammes and has averaged 90 grammes; the carbohydrate has ranged from 125 to 200 grammes, and the protein, formerly reckoned at one gramme per kilogram of body weight, has lately averaged 70 grammes per day. One-quarter of the patients were men and three-quarters women. Their weight has been kept fairly close to the normal or a little less than the normal for height, sex and age. Nevertheless eighteen of the patients were above their normal weight, a fact referred to by the authors as a blot on the educational record.

It is important in such an inquiry to know the degree of severity of the diabetes, and this has been assessed in this instance by the insulin dosage. Four groups of patients were thus distinguished: those in the first group took no insulin; in the second group the daily insulin intake was up to 25 units; in the third group 25 to 50 units, and in the fourth group 50 or more units were given daily. The degree of control of the disease was estimated by the range of the blood sugar level. This seems to be a standard subject to criticism, inasmuch as it suggests a false accuracy; but as a rough method of expression of the degree of control it serves its purpose. The four groups here arbitrarily chosen include patients whose blood sugar levels are under 140 milligrammes, 140 to 180, 180 to 250 and over 250 milligrammes *per centum*. The various degrees of severity and of control of diabetes were all well represented in this series. General observation showed that the disease did not always tend to become more severe. At the end of a five-year period, in 45 of the patients no change was necessary in diet or increase in insulin requirements; in fact, in ten of them less insulin was required, and in the remaining 55 increased insulin was accounted for in part at least by increases in diet. A mild anæmia was not uncommon. It would be interesting to know if the incidence of anæmia in any way differed from that found in comparable age groups of persons who did not suffer from diabetes. Chronic infections were relatively common and occurred in 39 patients out of the 100. Cholecystitis was the most frequently observed infective condition, occurring in 16 cases.

The cardiac studies were interesting. Hypertension was present in 38% of cases; all these patients were over fifty years of age. No connexion could be traced between the duration, severity or degree of control of the diabetes and the onset of hypertension. It is interesting to note that the incidence of cardiac enlargement in these patients was only about one-half that found in non-diabetic hypertensives. With this can be linked up the finding that the electrocardiographic changes often seen in hypertension with left ventricular strain were not observed in this series. Joseph Edeiken, who investigated this aspect of the inquiry, thinks that by comparison with records of other studies in the literature the value of the diet with the high carbohydrate and low fat content in reducing the incidence of cardiovascular complications is clearly indicated.

A further study of the peripheral circulation of these patients indicated that arteriosclerotic disease of the occlusive type was not common, and no serious incidents occurred. The ocular condition of the patients was also found to be satisfactory. Subcapsular cataracts were still found, but the incidence or degree of ocular sclerosis did not seem to depend on the degree of the diabetes. Deep retinal hæmorrhages and exudates were found to increase with the duration of the diabetes and were only slightly decreased by closely observed treatment.

Too much emphasis must not be laid on the advantages of any one aspect of treatment, for there are many uncontrolled factors. For example, the excellent record of these patients in escaping serious vascular complications in the lower limbs is probably a tribute to the care bestowed on this feature of their treatment and the prompt correction of local infections by modern methods. But the record is a good one and should encourage those who patiently continue the supervision of the often refractory subjects of a life-time disease, in itself no easy task.

No attempt has been made to draw distinctions between diabetics of different ætiological types in this analysis. The subject is still rather nebulous, but it would be interesting to see a long range plan made for such a comprehensive inquiry. Robertson F. Ogilvie has recently summarized the ætiological factors in diabetes.[1] He

[1] *The American Journal of the Medical Sciences*, January, 1945.

[1] *Edinburgh Medical Journal*, November-December, 1944.

traverses the curious inconsistencies found in the pathological changes in the pancreas, and discusses the long-debated questions of the pituitary hormones and the probable relationships of these with pancreatic function. This is not relevant to our present discussion, but recollecting the great importance of the different physical types in diabetic patients, for example, the "overgrown" child and the obese adult, and the insulin-sensitive and insulin-resistant types encountered in treatment, we shall see that these considerations must enter into a full and judicial inquiry into the results of treatment. Ogilvie emphasizes the complex pathological problems involved. Not only are the endocrine factors not yet entirely understood, but even ketone production is not so straightforward as once we thought. The selective action of alloxan on the pancreatic islets has placed a new experimental weapon in our hands. Study of rats simply rendered diabetic by a couple of injections of alloxan has shown that in these animals at least diet can control the condition, particularly if the fat content is raised, but raised slowly. J. H. Burn, T. H. C. Lewis and F. D. Kelsey, in describing a research along these lines, deprecate any suggestion that the results with rats can be applied to man.[1] But it is possible that even such proof as Richardson and Bowie have given that a diet with a high carbohydrate content will give excellent results must not close our minds to progress. Perhaps the triumph of insulin has diverted research somewhat from the purely dietetic side. The lot of the diabetic is now a very tolerable one, offering a life compatible with activity, usefulness and quite a high standard of health. It may yet be even better.

## THE TOXIC EFFECTS OF SALICYLATES.

OVER fifty years of experience with the use of the salicylate group of drugs have not brought a sure knowledge of their mode of action or even of their exact value. This is curious, seeing that salicylates, especially in the form of aspirin, are so universally used that their distribution among the races of the world might be adopted by some cynical philosopher who was devising a simple standard of civilization, whatever that war-debased word may mean. The valuable analgesic and antipyretic properties of salicylates are of course well known, but physicians do not yet agree as to their specific effect, if any, in acute rheumatism. Some of the more recent studies have cast doubt on the value or even the propriety of the simultaneous administration of alkalis, and light has also been shed on the mechanism of the observed toxic effects. Coburn aroused fresh interest by asserting that a specific anti-rheumatic effect can be obtained in acute rheumatism by maintaining a high blood level, and as the dosage advocated by him was by usual standards potentially toxic, the whole question calls for further study.

Gladys Y. Fashena and James N. Walker contribute some observations on the effect on prothrombin production and the alkali reserve which are helpful in understanding the mechanism involved.[2] They report the case of a nine-year-old boy who was treated after the high dosage method of Coburn and who suffered from salicylate poisoning. In view of the suggestion often put forward that rheumatic patients are more tolerant of these drugs than other children, this report is timely. Rather, it seems to be a safer generalization that individual variation is bound to occur with all drugs and that "boldly yet with caution" is still a sound motto in therapeutics. The boy in this case was given six grammes a day of sodium salicylate for four days, none for four days, and then the dose was advanced to eight grammes daily. After a few days air hunger was noticed, and this persisted, till the drug was discontinued some days later. Vomiting and hallucinations were also observed, and albumin, cells and casts appeared in the urine. The hyperpnœa was not affected by oxygen, the carbon dioxide combining power was only 33 volumes *per centum*, and prothrombin was almost absent from the circulating blood. No ketones were excreted in the urine. Synthetic vitamin *K* was administered in doses of one milligramme four times a day, and the child rapidly lost these abnormal signs. Acetyl-salicylic acid was now given in doses of one gramme and later two grammes a day without the appearance of untoward symptoms. Fashena and Walker refer to the work of numbers of other observers who have found prothrombin formation greatly decreased by salicylates and who agree that vitamin *K* will give protection against this toxic effect. Whether ketosis is a feature of salicylic poisoning or not is doubtful—the evidence seems rather conflicting. In the case cited here it seems definite that the Kussmaul type of breathing observed was not associated with ketosis; the authors think it was more probably due to a direct effect on the central nervous system.

Fashena and Walker conclude that if it is desired to use a high dosage schedule in the treatment of rheumatic fever, it is desirable to control the dosage by serial estimations of the blood salicyl level. Coburn's method entails the maintenance of a blood salicyl level of the order of 350 microgrammes per cubic centimetre. This involves some degree of risk, and ideally would enable the minimum dosage for the maximum effect to be employed. It should be observed in conclusion that we still await exact proof that such high dosage plans are scientifically justified. It is also interesting to look into the future and to attempt to envisage the elaborate methods that therapeutics of tomorrow may entail.

[1] *British Medical Journal*, December 9, 1944.
[2] *American Journal of Diseases of Children*, December, 1944.

## THE BLACK HOLE OF CALCUTTA.

H. P. BAYON has written about John Zephaniah Holwell and the Black Hole of Calcutta.[1] He recalls that when Fort William, Calcutta, was invested by the Nawab of Bengal, and the Governor, Roger Blake, abandoned his post, the command of the station was left to Holwell, a surgeon. The Europeans fought till their ammunition was exhausted and surrendered, the Nawab assuring Holwell that they would be honourably treated. Holwell reported that 146 persons were thrust into the guard room of the fort at eight o'clock in the evening; the door was opened at six o'clock on the following morning. The floor space was 308 square feet and the breathing space about 30 to 40 cubic feet per person. Twenty-three persons survived. Bayon states that tests and experiments have not confirmed the view that the deaths were due to an excess of vitiated air or carbon dioxide or perhaps to a lack of oxygen. He concludes that the casualties in the first half-hour or so must have been due to suffocation through crushing, without there being any lack of air. Had the prisoners kept perfectly still more would have survived. Heat stroke probably accounted for the later deaths. If human beings are closely confined in a room, the walls of which are near or above body heat, the temperature of the bodies will rise approximately by 1° C. per hour. Once fever is reached, delirious conditions follow, with convulsions, coma and death. This is probably what happened in the "black hole".

## A SHORTAGE OF X-RAY FILM.

IN another place in this issue there appears an announcement from the chairman of the Medical Equipment Control Committee regarding an acute shortage of X-ray film. This is a matter of which medical practitioners must take immediate and effective notice. The shortage is world-wide and the statement that lack of economy will be followed by inability to obtain any film at all is not an idle one. A cut of 50% in the civilian use of X-ray film is heavy, but it will have to be made. In the interests of patients for whom the use of film is indispensable the most rigid economy should be practised. This intimation should be taken to heart by general practitioners and by specialists, as well as by radiologists, for they have to decide in most cases whether an X-ray examination requiring the use of film is necessary or not.

[1] *Proceedings of the Royal Society of Medicine*, November, 1944.

# Abstracts from Medical Literature.

## PÆDIATRICS.

### Erythroblastic Anæmia with Bone Changes in Egyptian Children.

M. DIWANI (*Archives of Disease in Childhood*, December, 1944) describes three cases of Cooley's syndrome, two in genuine Egyptian children and the third in a Greek child. The author draws attention to certain clinical characteristics. The face is mongoloid. This is partly due to a thickening of the malar bones and partly to a muddy yellowish discoloration of the skin. The head is large and irregularly shaped with prominent frontal and parietal bosses. The abdomen is prominent. This results chiefly from the increase in size of the spleen and liver. The heart is enlarged in many instances, a point to which Nemet and Gross have drawn particular attention. Marked enlargement of the heart was noticed in two of the author's cases. In most instances the skiagrams of the bones present a typical appearance. The long bones and small bones of the hands and feet are porous-looking with sharp trabeculations and thinning of the cortex. When the process is more advanced and the cortex is exceedingly thin, pathological fractures may occur. The cranial vault, in the early stages or in the mild cases, shows only thickening due to increased width of the diploë and thinning of the outer and inner tables. In the advanced cases the profile view of the skull gives the appearance of a surface studded with small radiating spicules, which is sometimes likened to "hair standing on end". Somewhat similar changes have been reported in sickle-celled anæmia, in acholuric jaundice, and in erythroblastic anæmia associated with idiopathic steatorrhœa. Examination of the blood reveals a severe hypochromic anæmia. The hæmoglobin value may be as low as 10% and the red cell count one million cells or less per cubic millimetre. The red cells show a marked degree of hypochromia associated with an extreme variation in the size and shape of the cells. The predominating cell is very large with a markedly uneven distribution of hæmoglobin. Cooley looks on these irregularly stained erythrocytes as characteristic of erythroblastic anæmia. The only other anæmia of childhood presenting a similar picture is sickle-cell anæmia. Erythroblasts and normoblasts in large numbers are present, but true megaloblasts are not found. Reticulocytes may number from 10% to as high as 30%. There is usually a persistent leucocytosis of from 13,000 to 30,000 cells per cubic centimetre. Cooley believes that the most striking feature is the frequent change from granulocytosis to lymphocytosis in the same case at short intervals. The fragility of the red cells is not increased. On the other hand there may be an increased resistance of the red cells to hypotonic saline solutions. This serves to differentiate Cooley's anæmia from hæmolytic (acholuric) jaundice in which the resistance is diminished. The indirect Van den Bergh reaction is obtained, the icterus index is raised, and the amount of urobilinogen in the urine and stools is increased. The bone marrow in these cases is said to be indistinguishable from that of pernicious anæmia, that is, it is megaloblastic. Sternal marrow puncture performed in two of the author's cases revealed an erythroblastic reaction. Fawdry, of the Cyprus Medical Service, in a personal communication showed the author films of the sternal marrow from the twenty cases he investigated in Cyprus, and in all of them the reaction was erythroblastic. The course of the disease is slow and progressively downhill.

### The Treatment of Cœliac Disease.

DONALD PATERSON, MILA PIERCE AND ELEANOR PECK (*Archives of Disease in Childhood*, September, 1944) report the treatment of twenty-six patients suffering from idiopathic cœliac disease and four suffering from "cœliac syndrome" with liver extract and vitamin *B* complex, given by both the parenteral and oral routes. The cases were classified as follows: (*a*) thirteen cases of idiopathic cœliac disease which were thoroughly investigated and met all the essential criteria common to the idiopathic form of the disease; (*b*) thirteen cases of idiopathic cœliac disease which presented the clinical picture, course and characteristic stool findings, but further confirmatory investigations were unobtainable owing to wartime restrictions of laboratory services; (*c*) four cases in which a focus of infection was discovered during a period of observation—"cœliac syndrome". The criteria of diagnosis were: (i) A history of refusal of food, failure to gain in height or weight, weakness and occasional vomiting. (ii) Bulky, pale, offensive stools with intermittent bouts of looseness or constipation. (iii) A total stool fat (well split) above 30% of a three-day sample of dried stool. Children presenting the symptoms mentioned above were further investigated for: (*a*) foci of infection in the respiratory tract and sinuses, (*b*) abnormalities of the gastro-intestinal tract, and (*c*) signs of tuberculous and other infections. To differentiate the true idiopathic case from the secondary or infective "cœliac syndrome" the following investigations were carried out: (*a*) The oral glucose tolerance curve was plotted as a measure of glucose absorption. (*b*) The vitamin *A* absorption curve was used as a criterion of fat absorption. (*c*) The barium meal served as a measure of motility of the small bowel. In cases of cœliac disease there is a characteristic clumping of the barium and a loss of the normal feathering pattern of the small bowel. (*d*) Trypsin in the aspirated duodenal contents was estimated to exclude fibrocystic disease of the pancreas. The following preparations were used in treatment: Liver ("Proethron Forte", Armour, two cubic centimetres given intramuscularly two or three times a week). Vitamin *B* complex. Lederle's "B complex" was given intramuscularly in doses of 2·0 to 3·5 cubic centimetres two or three times a week. "B-Plex" (John Wyeth) was given by mouth in doses of eight to sixteen cubic centimetres daily. A normally balanced diet was planned throughout the whole period. In severe cases this could not be given because of the recurrence of diarrhœal stools, and a diet with a low fat content was therefore necessary for a limited period. It is noteworthy that uncooked fats (for example, milk and butter fat) were well tolerated by all children after the first few weeks of treatment. Satisfactory gains in weight and height and improvement in general health were obtained in the early weeks of treatment and sustained over a period of months in the case of patients who received sufficiently intensive and prolonged therapy. Less dramatic improvement and less satisfactory weight gains resulted when the liver extract was given parenterally in conjunction with a vitamin *B* preparation given orally instead of parenterally. During or after the initial weeks of treatment the children were given and thrived on a normally balanced diet. The total stool fats improved in all but four cases and returned to normal in eighteen of twenty-six cases. Slow improvement was commonly associated with the occurrence of upper respiratory infections. In the secondary type of cœliac disease, "cœliac syndrome", resulting from chronic foci of infection, improvement appeared to be hastened by intensive therapy with liver and vitamin *B* complex.

### Prognosis and Treatment of Pneumonia in Children.

F. L. KING LEWIS (*Archives of Disease in Childhood*, September, 1944) draws a comparison of two groups of children suffering from pneumonia, a "pre-sulphonamide group" of 100 cases and a "sulphonamide group" of 127 cases. The total mortality rate in the first group was 18% and in the second 9%. An attempt is made to evaluate the therapeutic effect of sulphapyridine, sulphadiazine and sulphamethazine by a comparison of percentage mortality, response to treatment, complications and toxic effects. Sulphamethazine produced (*a*) the lowest mortality rate of 3·7% and (*b*) the quickest response to treatment—63% of patients were apyrexial and improving within two days and only 7·4% failed to respond within five days. There was no significant variation in the incidence of complications with the three drugs. Sulphapyridine produced vomiting, rashes and renal complications in a few cases: sulphadiazine and sulphamethazine were not toxic for these patients. A scheme of dosage is outlined which corresponds approximately to a "daily maintenance dose" for sulphapyridine and sulphadiazine of one and a half grains per pound of expected body weight per day for all ages up to ten years, and for sulphamethazine of two grains per pound of body weight per day. Estimation of the blood level of free sulphamethazine in recent cases showed a range from 3·4 milligrammes *per centum* to 37 milligrammes *per centum*. The aim was to produce a level of 10 milligrammes *per centum*. The optimum level is not established. It is suggested that the sulphonamide drugs can be used to the greatest advantage only if controlled by regular estimations of the concentration in the blood.

## ORTHOPÆDIC SURGERY.

### Ischæmic Nerve Lesions Occurring in Volkmann's Contracture.

W. HOLMES (*The British Journal of Surgery*, October, 1944) has investigated six cases of established Volkmann's contracture in which there was gross

damage to peripheral nerves resulting from the ischæmia. In five of these cases, even months after the accident, damage to the main artery of the limb was demonstrated at the level of the initial injury. In all cases there was extensive motor and sensory paralysis, but in only two of them was there evidence of direct traumatic injury to the main nerve trunk. In one of the cases the median nerve was constricted between the heads of the *pronator teres* muscle; but the part played by this constriction was probably insignificant. Histological examination of various small branches of damaged nerves showed in the least severely affected nerves an uncomplicated Wallerian degeneration. In the more severely affected nerves there had been a great increase in the collagen of the endoneurium, sometimes leading to complete collaginous replacement of the nerve bundle. In one case a nerve was entirely necrotic, having undergone a change similar to that found in a completely ischæmic muscle. These changes in nerves are due to ischæmia of varying intensity. There is no effective treatment for established ischæmic nerve degeneration. If the ischæmia has been so transient as to produce Wallerian degeneration and only slight endoneural collaginous change, then spontaneous recovery may be expected in the nerves so affected. Usually only slight recovery takes place.

### Diagnosis of Herniation of Lumbar Intervertebral Disks by Neurological Signs.

J. KAY KEEGAN (*The Journal of the American Medical Association*, December 2, 1944) discusses the symptoms and neurological signs caused by various degrees of retropulsion of the *nucleus pulposus* of the lower lumbar intervertebral disks. The author believes that most low back and sciatic pain is due to varying stages of herniation at a lower lumbar disk. He states that episodes of "lame back" and of "lumbago" are recognized to represent softening and loosening of the *nucleus pulposus* within the disk, with posterior shift and stretch of the enclosing ligament. Symptoms of true herniation of the *nucleus pulposus* occur when the enclosing annulus is ruptured and a sufficient amount of fibro-cartilage escapes through the opening beneath the posterior longitudinal ligament to produce an intraspinal tumour and pressure on a nerve root. The first and commonest symptom of true herniation is an aching in the "hip" or superior mid-gluteal region. This is due to contact of the posterior primary division of the compressed nerve root against the overlying *ligamentum flavum*. The nerve root is compressed beneath a special anterolateral portion of the *ligamentum flavum* which the author terms the "interarticular ligament". Greater compression of the nerve root involves the anterior primary division and causes "sciatica". In late cases back pain disappears owing to complete herniation through the longitudinal ligament. Signs of organic loss of nerve root function, by the finding of sensory and reflex loss, necessitate the location of the causative pathological changes directly on that nerve root and do not permit the interpretation of reflex pain from some distant region. Because the site of compression is proximal to the sensory ganglion, motor regeneration of compressed intraspinal nerve roots occurs more completely than sensory regeneration. The absence of trophic or sympathetic phenomena is due to absence of sympathetic fibres at the site of compression in the lower lumbar nerve roots. Accurate identification of the nerve root involved can be obtained if a careful history is taken and if areas of slightly reduced pain sensation or dermatome hypalgesia are carefully outlined. The common location of so-called "sciatica" pain in the back of the thigh and calf and the lateral aspect of the ankle and foot represents the first sacral nerve distribution. The author states that recognition of the commonest first sacral nerve syndrome with herniation of the fifth lumbar intervertebral disk, excludes most other pathological findings as a possible cause of this syndrome. When this first sacral nerve syndrome appears with loss of ankle jerk, it is impossible to attribute this to any extraspinal pathological change in the bone, as the first sacral nerve is entirely intraspinal until it enters the fixed first sacral foramen of the sacrum. The pain of fifth lumbar nerve root involvement is found to be located on the lateral aspect of the thigh and leg, in front of the ankle, on the dorsum of the foot and in the middle toes. Fifth lumbar nerve root compression commonly is caused by herniation of the fourth lumbar disk, although at times it may be compressed more laterally by a wide herniation of the fifth lumbar disk or by hypertrophic bone around an old degenerated and narrowed fifth lumbar disk. Fourth lumbar nerve root pain is definitely located on the anterolateral aspect of the thigh, over the knee-cap and down the inner side of the leg and foot to the great toe. Absent knee jerks occur when this root is compressed. Compression may be due to pressure in the intervertebral canal from lateral herniation of the fourth disk and may be missed at operation. Third lumbar nerve root pain occurs on the anterior aspect of the thigh and medial aspect of the knee. Third nerve root involvement is not often associated with herniated intervertebral disks, but is more likely to be due to the common lateral hypertrophic bone disease of this region, old fracture or metastatic cancer from the prostate. The second sacral nerve root can be involved over a sixth lumbar disk when there are six well-formed lumbar vertebræ or by wide herniation of higher disks which compress medial nerves of the *cauda equina*. An occasional variation occurs in the position of nerve roots, usually associated with anatomical abnormality in form or sequence of cervical or thoracic vertebræ which places sciatic nerve roots one vertebra higher than usual. Hence the second sacral nerve root by dermatome pattern may be placed over the fifth lumbar disk. Paræsthesia and hypalgesia are even more accurately localized in the single nerve distribution than is pain. Treatment should be conservative until seriously disabling and persisting or recurring pain indicates that a fixed herniation is present. The author states that if the interpretation is correct that most low back and sciatic pain is due to varying stages of lumbar disk herniation, few persons escape some episode of this nature, and in the past the great majority of them have recovered without surgical operation on a disk. A method of manipulation which may permit replacement of the herniated disk in early cases is described. When after a few weeks of rest in bed, traction, manipulation or the wearing of a belt, no improvement occurs, surgical operation should not be withheld. Operation for herniation does not weaken the supporting structure of the back and the patient is on his feet in comfort in less than two weeks.

### Battle Casualty Fractures in Italy: Treatment with Penicillin.

J. S. JEFFREY (*The British Journal of Surgery*, Special Issue, 1945) contributes part of a report submitted to the Director of Pathology, War Office, from a penicillin control unit. About 150 battle casualty fractures of the femur were treated with penicillin (average 800,000 units). In the forward areas the wounds were excised, insufflated with penicillin-sulphathiazole powder, left open and covered with "Vaseline" gauze; the fracture was immobilized for transport. At the base hospital the wounds were trimmed, if necessary, and partially sutured, the middle of the wound being left open for drainage. Latterly better results were obtained by having the patient "penicillinized" for twenty-four hours before operation. The course of penicillin was continued after operation for four to nine days and longer. The wounds were left undisturbed for twenty-one days. The report states that there were marked decreases in mortality and amputation figures. A certain number of femurs will always require amputation where the bone defect is so great that an artificial leg is a better proposition, and when there is a major vascular injury. Few patients, if any, should die through sepsis if the organisms they are harbouring are sensitive to penicillin. Although there was a decrease in major sepsis, about one-quarter of all the patients whose fractured femurs were treated with penicillin showed signs of minor infection three months after receipt of the wound, which is similar to the infection rate in contrast cases in which patients survive for the period. This persistence of infection was due principally to difficulty in maintaining adequate drainage of Gram-negative pus and autolytic products, and to a lesser extent to insufficient penicillin and insensitive strains of staphylococci. The report suggests that anterior wounds can safely be sutured, but that posterior and main drainage wounds should be sutured only in any part well away from the main drainage channel. The maintenance of dependent drainage for the first ten days of treatment is so important that sometimes large-bore rubber tubes were inserted down to the fracture site if it was feared that the muscles might come together too quickly. Suture gives support to granulation tissue in shutting off the fracture from the exterior and also helps to obliterate dead space. It is probable, too, that the minimal scarring so produced is an aid to later joint movement. Postural drainage of anterior wounds was obtained by turning the patient onto his face for several hours each day, the limb being immobilized in a Thomas's splint with fixed traction and encircling plaster band.

# British Medical Association News.

## SCIENTIFIC.

A MEETING arranged by the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association, in conjunction with the Mental Hospitals Department, was held at the Mental Hospital, Callan Park, on October 26, 1944. The meeting took the form of a series of clinical demonstrations. Part of this report was published in the issue of April 14, 1945.

### Epileptic Insanity with Monochorea.

DR. C. S. ROBERTS showed a male patient, who at the age of eleven years had been knocked down by a motor-car and treated for four months in hospital. After one month trephining over the left temporal region was carried out for brain laceration. After the accident he was unconscious for sixty-seven hours. He was well for six months after his discharge from hospital, but at the end of the six months epileptic seizures occurred, and a further operation was performed on the right temporal region. From this time on the seizures became fairly frequent, and were severe in nature. He was admitted to a mental hospital in 1935. Shortly after his admission he attempted suicide by rushing head-first through a window, and later expressed the intention of repeating this. He said that he was sensitive about his seizures, as boys at school laughed at him. He had stuttered ever since the accident, and soon after the operations monochorea of the right arm and hand developed. At times these movements were violent, at others less so, but they had no apparent reference to oncoming seizures. As aura he described a sensation of heat and cold below the left costal margin. He complained periodically of severe pain in the left temporal region, rarely on the right side.

Dr. Roberts said that the patient was childish and simple, a typically quarrelsome epileptic. He was employed in the occupation therapy room, making baskets, and turned out good work. He was able to a certain extent to control his choreic movements. Recently he had twice made attempts at suicide. Neurological examination revealed several abnormalities. Anæsthesia of the fifth right cranial nerve, weakness of the seventh left cranial nerve and involvement of the eighth right cranial nerve were present; the right ear was deaf to the tuning-fork by bone and air. The patient spoke with a considerable stammer and associated slurring. On the right side hemianæsthesia to light touch, heat and cold was present. Stereognosis was impaired on the left side. Monochorea of the right arm and hand was present.

Dr. Roberts added that the pathogenesis of such involuntary movements was obscure. By some they were ascribed to lesions of the short axones passing from the small cells of the caudate nucleus and putamen to the *globus pallidus*. In congenital athetosis and chorea the lesions were found chiefly in the caudate nucleus and putamen. Acute focal lesions of the subthalamic body, however, were known to produce monochorea or hemichorea of the opposite side, and choreiform movements were known to follow lesions of the superior cerebellar peduncle and the optic thalamus.

### Organic Dementia.

Dr. Roberts also showed a male patient, aged sixty-five years, who had been admitted to hospital in 1917 with a history of having had a chancre which healed. This was followed by enlargement of the glands in the groin, gummata and a rash. He was treated at a hospital, and returned nine months later suffering from severe headaches which prevented him from sleeping. Dr. Roberts said that the patient had a right-sided hemiplegia and aphasia dating from 1917. He was unable to convey any ideas or to understand completely spoken speech. He was totally blind in the left eye, which had a corneal opacity, possibly of syphilitic origin. In spite of his history of chancre, gummata and rash, his blood did not react to the Wassermann test. In 1917 his cerebro-spinal fluid reacted to the Wassermann test. He had had intense anti-syphilitic treatment at another hospital. Since 1920 neither his blood nor his cerebro-spinal fluid reacted to the Wassermann test. His dementia was of long standing and advanced. Aphasia was manifested by the repetition of stereotyped phrases: "I can't tell you"; "I won't tell you"; "Good boy, I like you". Occasionally he became obscene, especially if annoyed, when his vocabulary increased, and at times he surprised one by answering questions sensibly. He sang, and then used the correct words of the songs. Spastic paralysis of the right arm in flexion was present, and also spasticity of the right leg, which made the gait shuffling. His dementia was fairly profound; he was faulty and dirty in habits.

### Paralytic Type of Idiocy.

Dr. Roberts's third patient was a male, aged fifty-five years, who had been admitted to another mental hospital in 1927. He was a surviving twin; the other twin was said to have been normal. The patient was unable to speak, and was paralysed and deformed in the lower extremities, which were permanently flexed. A spastic or athetoid movement affected both arms and hands, which were also deformed. He was faulty in habits and completely bedridden. Many degenerative stigmata were present. Dr. Roberts said that the interesting feature of the case was the patient's knowledge and apperception. He knew the day and date, the time of day, his own age, when various attendants were due for leave and when they were due to return to duty. He was a good "watch-dog" in the ward, his various articulations indicating that the attention of the attendant should be drawn to some incident—for example, a patient getting into the wrong bed, the telephone ringing, the medical officer beginning the rounds, *et cetera*. He dearly loved a story of the non-drawing-room type, and had marked personal likes and dislikes. Could his intelligence quotient be taken, the patient would not really be classified as an idiot; he was probably only imbecile.

### Mutism of Seventeen Years' Duration Treated by Electroconvulsive Therapy.

DR. CLIFFORD HENRY showed a male patient, who had been admitted to the hospital on April 23, 1920, at the age of twenty-four years. The patient was born in New South Wales and was unmarried; he was an ironworker's assistant. His father was still alive, brisk and irascible. His mother was alive but senile. A paternal uncle had been in a mental hospital years earlier, and a sister was in Callan Park Mental Hospital.

Dr. Henry said that the patient had had a normal childhood and school career and was always socially well adjusted. He enlisted in 1915 and was two years in the front line in France, being exposed to shell-fire. On the voyage back to Australia he persistently tried to throw himself overboard, stating that he had no wish to live, owing to his past life. He said he had been in Bulford camp, suffering from gonorrhœa and syphilis. He actually had gonorrhœa, but his blood had never reacted to the Wassermann test. He was admitted to the hospital as a voluntary patient and was obviously suffering from paranoid schizophrenia. He said that a mind reader was put on him by wireless, who read his thoughts and drew unseemly thoughts from him. He also believed that doctors put electric wires on his feet at night as punishment, and had other ideas of persecution. For some years he was catatonic and manneristic, and would stand for hours in one attitude, with his chest puffed out. He refused food and was fed through a stomach tube. He was mute for a period of three years, and then went to his home at Newcastle. He was certified insane on September 18, 1925, his certificates stating that he had a childish, vacant expression, could not express himself rationally and made continual purposeless movements. He had assaulted his father and sister and used to swim out to sea without thought of sharks or danger. In 1926 he became mute again, but used to communicate with everyone by means of notes. He went to Sydney by himself frequently, making himself understood by signs, and also went swimming. In July, 1943, he was given electroconvulsive treatment, with the deliberate hope of curing his mutism, and after the second convulsive seizure he began to talk and had continued to converse satisfactorily ever since, after having been mute for seventeen years.

Dr. Henry said that mutism was stated to be due to (*a*) extreme depression, in which the patient was too wrapped up in his own misery to bother to talk and had not the necessary inclination to do so, (*b*) complete catatonic indifference to the environment, (*c*) negativism, (*d*) obedience to hallucinatory commands, (*e*) a complex-determined belief, and (*f*) extreme difficulty in thinking. In the present case the patient was far from being depressed, as he went to Bondi twice a week and thoroughly enjoyed his swim; he was not negativistic, as he made himself understood by writing, and had no difficulty in thinking. It appeared, therefore, that he was mute in obedience to "voices" or to a belief that he should not talk. At the time of the meeting he was well orientated, went to Sydney frequently by him-

self and stated that he did not now hear "voices"; if he was delusional, he hid his delusions. He was manneristic, walked round a table two or three times on his way to meals, and lacked sufficient initiative to care for himself properly away from hospital.

### Eunuchoid Gigantism.

Dr. Henry also showed a male patient, an unmarried farmer, aged twenty-one years, suffering from eunuchoid gigantism. His father was healthy in life, but had died of gunshot wounds a year earlier, the coroner finding that death was accidental. The mother had been in another mental hospital for some years. One brother was alive and well, one brother died in infancy, and one sister was alive and well. Dr. Henry said that there was thus a strong hereditary factor in the mother's insanity; the father's death might not have been accidental, and the death in infancy of a brother might not be unimportant.

The patient was a healthy child until the age of ten years, when he began to suffer from attacks of tachycardia. He was at school from the age of eight to the age of fifteen years; he reached sixth class, but was not a good scholar, and then began farm work on his father's dairy farm. He never handled money himself, except to go to cinemas. He had masturbated to excess since quite young; he had recently become interested in Jehovah's Witnesses, and acquired a guilt complex concerning masturbation.

On his admission to hospital he was confused and impulsive, and denied any recollection of his father's death; he was in a state of acute anxiety over his sex abnormalities. He was very tall (six feet three and a quarter inches in height), with a sallow complexion, sparse facial hair, horizontal (feminine) type pubic hair, marked mammary areolæ, misshapen ears, large feet and very large hands, and a dilated heart; his blood pressure was low (systolic, 100 millimetres of mercury; diastolic, 60 millimetres). The lower height was much greater than the upper height (the distance from the vertex to the *symphysis pubis* was 35·75 inches and from the pubis to the soles of the feet 39·75 inches). The distance between the extended finger tips was six feet eight inches and the height six feet three and a quarter inches. (In the normal subject, the upper and lower heights were equal, and the finger tip distance equalled the height.) His genitals were small for his size; he had sparse body hair, but thick hair on the scalp. X-ray examination revealed no abnormality in the cranial bones, including, it was assumed, the *sella tursica*. Dr. Henry said that it was stated that pituitary eosinophilic adenoma might stimulate the eosinophile cells of the anterior portion of the pituitary gland, and by crowding suppress the basophile cells, which might in turn inhibit gonad function and thus cause eunuchoid gigantism.

### A Case for Diagnosis.

Dr. Henry also showed a male patient, aged thirty years, a married naval stoker who had been born in England. The patient was unable to give a rational history, but was insanely grandiose, stating that he had a Victoria Cross with five bars, that he had killed 7,592 Japanese single-handed, that his heart, liver and lungs had been torn out by a six-inch shell and replaced by plastic surgery, that he had been 573 times round the world, and that he was an admiral, a surgeon commander and a graduate of all universities. His general bodily systems were normal; his pupils were unequal, but reacted to light *et cetera*. The other reflexes were normal. Serological investigations had consistently produced negative results.

### Paget's Disease of Bone.

DR. S. J. MINOGUE showed a female patient, a senile dement, aged seventy-five years, who had been admitted to the Mental Hospital, Rydalmere, on February 27, 1944. She also had fairly advanced Parkinson's disease. She had Paget's disease of bone, with the classical sabre-shaped tibiæ, deformity of the right radius and the spine and early changes in the frontal bone. The condition had been present for many years.

### Possible Pituitary Dwarfism.

Dr. Minogue next showed a female patient, aged twenty-four years, a low-grade imbecile, who had been admitted to the Mental Hospital, Rydalmere, on August 4, 1944. She was an affectionate, spoilt child, who was given to outbursts of temper. Her height was fifty inches and her weight eighty-three pounds. Her secondary sexual characteristics were normal and her bodily proportions within normal limits. Her menses were normal. She had an overgrowth of black hair on the body, face and limbs. The thyreoid gland was grossly and uniformly hypertrophied. Dr. Minogue thought this was possibly the result of thyreoid medication extending over many years. He said that she was presented as an unusual example of dwarfism, probably of a rare pituitary type.

### Achondroplasia.

Dr. Minogue also showed a female patient, aged seventy-four years, a senile dement. He said that she was a typical achondroplasiac, but showed in addition a gross malformation of the jaw due to chronic osteomyelitis of about fifty years' standing. She would not cooperate in treatment or in having an X-ray picture taken.

### Molluscum Fibrosum Associated with Epilepsy.

DR. E. T. HILLIARD showed a male patient, aged fifty-three years, suffering from *molluscum fibrosum* or Recklinghausen's disease associated with epilepsy. He had been admitted to hospital seven months earlier, dull, confused and disorientated, having been remanded for medical observation following a charge of attempting to inflict grievous bodily harm. It was elicited that he had been a sufferer from epilepsy since the age of seventeen years, and he now averaged six seizures per month. Subsequent investigation disclosed that his attempted assault on a room-mate with an iron bar followed an epileptic seizure, and that he was under the belief that he was about to be murdered and robbed. Investigation of his family history disclosed the fact that a brother had died in a mental hospital. The patient was born in the country; he had been a poor scholar and was always a bush worker. His sister stated that his "pimples" developed at the age of eighteen years, within a month of his being robbed of all his savings. The order of appearance of the lesion was not especially noted—it seemed to appear "all over him".

Dr. Hilliard said that the outstanding feature in his physical appearance was the occurrence of countless numbers of cutaneous growths. These were thickly arranged on his trunk, face and extremities to such an extent that auscultation of his cardiac area was impeded. These cutaneous growths varied greatly in size and might be papular, sessile or pedunculated. They were neurofibromata of the terminal branches of the cutaneous nerves; but the fibrous tissue of the cutaneous blood vessels or glands might also be involved.

### Paraphrenia Associated with Paget's Disease of Bone.

Dr. Hilliard also showed a male patient, who had been admitted to the Mental Hospital, Parramatta, on February 29, 1944. He was born in England, and was now aged fifty-nine years. No family history was obtainable. The patient went to sea at the age of twelve years and was ship's fireman till the age of thirty-five years; since then he had worked on wharves, docks *et cetera*, but had done no work for the last ten years. He had come to Australia in 1910 when aged twenty-five years, and married shortly after; he had nine children, all healthy. He had been a moderate drinker till ten years earlier (the age of fifty years), but had not touched alcohol since. His previous illnesses were a "touch of clap" before marriage (but his blood failed to yield the Wassermann reaction) and malaria at about the age of thirty years and several attacks since. He fell into the ship's hold when aged forty years; no hospital treatment was given, but he was said to be "mental" after this, and had the idea people were drugging him and spraying acid on him. When admission to Broughton Hall was suggested the ideas left him; but they returned six years prior to the meeting and his wife left him. She returned later, and the ideas of persecution were absent till three years prior to the meeting; since then they had persisted. He had done only six weeks' work in the last fifteen years. Early in February, 1944, he complained that his wife and children were poisoning him and threatened his wife with a knife. He threw medicine bottles at her and the children. He broke up two wireless sets. He locked himself in the bedroom at night and turned his wife out; but he often went round the house with a torch to see if anyone had set poison for him. Following his threats he was summoned to appear at a police court and was remanded for medical observation. In the observation ward he said that he had been "in hell" for years because of the drugs and poisons given him by his wife and children. They affected his legs, and when he took salt to make him vomit he could feel the acids and poisons coming out of his legs into his stomach and out of his mouth. His wife could gas him with a flick of her fingers. The acids burned his brain and dulled it.

On his admission to mental hospital he was noticed to have a large head and enlargement of his right tibia. He did not complain of these. After some weeks he was unable to stand, and the tibial enlargement had increased. Both ulnæ were enlarged. X-ray films of the skull, tibiæ and pelvis all showed Paget's disease of bone. Dr. Hilliard said that the delusions the patient had on his admission were not evident now, and he did not complain of poisoning. His wife stated that his head was large when she married him (he was then aged thirty-one years) and he took a size seven and a quarter hat; but no hat would now fit him. She also stated that some swelling of his leg had been present for the past five years; but the patient stated that the swelling of the leg and the increased size of the head had occurred in the past twelve months.

## NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioner has been released from full-time duty with His Majesty's Forces and has resumed practice as from the date mentioned:

Dr. W. H. Ward, 600, Barkly Street, Footscray, Victoria (April 15, 1945).

# Special Correspondence.

## LONDON LETTER.

By OUR SPECIAL CORRESPONDENT.

THE negotiations mentioned in the last London Letter (January 13, 1945) as then about to begin between the British Government and the accredited representatives of the British Medical Association on the Government's proposals for a national medical service, have been in active progress ever since, and the first results are now available. From these it is clear that the Government has given nothing away. The profession's doubts about the 90% or 100% availability of such a service have been swept into political oblivion. The Government repeats and maintains that it is committed to the principle of organizing the medical resources available at any given time to the best advantage of the community as a whole without any limitations of income, employment, or other irrelevant qualification. The last has a Churchillian touch about it. In other words, the Government is more concerned with the political issues than the purely medical and is fully determined to proceed with its proposals despite any objections from the profession. To compensate for this stand-and-deliver attitude the Government representatives have conceded certain minor points of administration. They have, for example, agreed to give the profession more adequate medical representation on the Central Health Services Council and other committees, such as the Statutory Medical Advisory and Hospitals Advisory, to be set up under these new administrative proposals. It is, however, to be specially noted that all these bodies are to be advisory only and will have no executive powers. It is a matter of common knowledge that advisory committees cut no ice with governments or cabinet ministers. Amongst other concessions extorted from the ministry officials are that the Central Health Services Council, on which the profession is now to have a voting majority of one, is to have the right of publishing its own report; that general practitioners are not to be in contract with local authorities, and that buying and selling of practices can properly continue in the meantime, and if the right is eventually abolished the doctor affected will receive all proper compensation. It may be remembered that these two last were very sore points at the December meeting of representatives. All these and other ameliorations in the Government's proposals for a national medical service have now been carefully considered by the Council of the British Medical Association, and their recommendations thereon are to be submitted to a special representative meeting called in London for May 3 and 4. It will be interesting to see the profession's reactions to these so-called ameliorations in the Government's original proposals, for there can be no doubt that the profession is in a cleft stick. It must either accept or decline, and there is not a sufficient majority either way. That the Government's proposals for a national medical service will, in due course, become the law of the land seems as certain as anything political can be, and it is frankly impossible to foresee what effect they will have on the future fortunes of the medical profession. Revolutions always have unexpected consequences, but many members of the profession view the prospect with dismay. The voluntary hospitals, too, are filled with foreboding, for any money that comes to them under the government scheme seems likely to be administered by the local authority, and he who pays the piper calls the tune. The lay Press has, as this journal pointed out a short time ago, as usual misrepresented the position accruing from the negotiations. It has asserted that the Government has surrendered to the doctors. It has done nothing of the sort. It has simply agreed to consider certain alternative proposals for the central and local administrative structure of the new proposed medical service to the nation. Not until the Cabinet knows what attitude the May representative meeting takes to these suggested alterations, will it even begin to consider their acceptability or otherwise, and even then the views of other bodies such as the voluntary hospitals and local authorities will be taken into consideration. It almost seems as though the attitude is "heads I win, tails you lose". Coincident with the appearance of this letter or shortly afterwards every member of the medical profession in Australia ought to receive from the London headquarters a complete statement of the present position in this country. In view of its own proposals it can hardly be doubted that the Commonwealth Government is watching the progress of events with interest. It behoves the medical profession to be equally watchful.

March 30, 1945.

# Correspondence.

## ON THE OVERCROWDING OF THE MEDICAL FACULTY IN THE UNIVERSITY OF SYDNEY.

SIR: Two distinct but related problems are involved in the overcrowding of the medical faculty at the University of Sydney. The first is: "What is the optimum number of students that should be taught in a faculty of medicine in a university?" The second is more complex and concerns that essential of medical education, the teaching of anatomy by the dissection of the human body. It is axiomatic that a medical student should at some time during his course have taught himself the detailed structures of the human body by actual dissection. This means that the community must be sufficiently educated for the requisite number of people to leave their bodies for scientific study; the other possible source, namely, the bodies of people who die unclaimed by relatives or friends, is steadily diminishing with general improvement in social conditions of the present times. No government dare face any compulsion in this matter, and we are thus faced with the education of the community to an appreciation of the fact that if they require adequately trained doctors, they must supply medical students with one of the materials so necessary for that training, namely, human bodies (see also the *British Medical Journal*, December 23, 1944). This is a slow process and is as yet quite inadequate even for an optimum number of students.

This brings us to our first problem. It has long been a clearly recognized principle in medical education that the maximum number of students per year in a faculty of medicine should not exceed 100. This principle has been applied in the best medical schools in England and America for over twenty years, and it has been further reinforced by the most recent authoritative report on medical education in England, namely, the "Goodenough Report". Thus it will be seen that the tremendous overcrowding in the Faculty of Medicine in the University of Sydney is quite contrary to all accepted principles of medical education. Adequate teaching in anatomy, adequate clinical teaching in hospitals, including training in obstetrics, to mention one case only, all become impossible. The material and teachers are not available; so when attempts are made to meet the situation, the teachers are overworked, the students must be inadequately taught, and ultimately complete breakdown and degeneration must result. This brings us to the only answer: (*a*) limitation of the number of students; (*b*) creation of a second university in New South Wales in some large centre of population, such as Newcastle. These must ultimately come, whatever be the forces and interests opposing them. I have deliberately omitted other problems

such as those of accommodation and the number of teachers available, as these can gradually be solved. The above two fundamental problems have had to be met elsewhere and solved on the principles outlined.

I have omitted any detailed discussion of the effects of the present overcrowding, but it is of concern to the graduates of Sydney University Medical School to see how it affects the classification of their old school. When we examine the standards set by such authorities as Flexner *et cetera*, then it is clear that our medical school is now reduced to the lowest grade in every respect, too many students in relation to staff, lack of accommodation, lack of material for anatomical teaching, insufficient clinical material for adequate teaching in medicine, surgery, obstetrics *et cetera*, and finally lack of time and opportunity for research work on the part of the staff, a feature which is the real life blood of a school.

In conclusion, I cannot do better than quote the concluding sentences of a report from the Department of Anatomy to the Faculty of Medicine: "It is scarcely necessary to point out the disintegrative effect of these numbers upon the work of the last 30-40 years. All the requirements for research, namely, scientific equipment and library facilities, grants of money and adequate leisure, which had been built up by my predecessors and myself, have been rendered useless and ineffective by the numbers of students in recent years, culminating in the present position."

Yours, etc.,

A. N. BURKITT,
Professor of Anatomy,
University of Sydney.

Sydney,
April 10, 1945.

## THE PHARMACEUTICAL BENEFITS ACT, 1944.

SIR: I would commend the sentiments expressed by Dr. C. Jaede in the journal of April 7, but he appears to overlook what to many others and myself are two fatal objections to the act in question. As a practitioner of some forty years' experience I know that to be limited by a formulary, particularly one drawn up by a committee on which are only two medical practitioners, will seriously interfere with the help I wish to give my patients.

To insist that the patient be examined by the doctor on each occasion that a prescription is given is just plain racketeering.

Yours, etc.,

ERNEST CULPIN.

Ballow Chambers,
Wickham Terrace,
Brisbane, B17.
April 12, 1945.

SIR: May I be permitted the space to reply to Dr. C. Jaede's letter in your issue of April 7, 1945. In these days of hard-headed materialism, it is indeed refreshing to note views of idealism, even to the extent of pipe dreaming. However, let us examine his statements. The Government was certainly elected by the majority of the people who "exercised their franchise", but their preelection platform did not disclose that their social services plans, in which is included the pharmaceutical benefits, were to be instigated, particularly in wartime. That mandate was not given. That "red herring" was thrown the other way.

Inasmuch as this is a democracy, any section, be it ever so small, has a perfect right to criticize any government plan. Whether this right is enforced is another matter.

Speaking also as a general practitioner in an industrial suburb for the past twenty years, with a lodge practice, I have a little knowledge of the facts as well as Dr. Jaede. Dr. Jaede says he can freely prescribe anything, but the dispensaries only "prefer" him to use their formulary, and the lodge patients know they have to pay for certain proprietary lines.

It will be a little difficult when he must use the formulary, so that any patient may receive free medicine, knowing well that any variation, however small, in an ordinary prescription has to be paid for.

He also seems to forget the penalty for prescribing without examination. Knowing well, he must realize how frequently this is done per telephone in the country.

As regards the inability of pensioners to pay for medicine, I believe this pension has been or is to be increased, but if it has not, there would most certainly not be any outcry against such, although this would be included in the social services plan, of which again we knew nothing prior to election and for which no mandate was given.

As regards the basic wage being insufficient for full "protective food and clothing allowances and vacation", he might allow his idealism to suggest some juggling to increase these, and not make the nation one of "medicine takers" as has been noted in New Zealand, and quoted by Sir Hugh Devine in his recent articles in the Melbourne *Age*.

As regards his visit to the lodge patient, this can hardly be quoted as an example, as the patient is provided for in his lodge benefits.

Finally, let us be honest, as he says. We know that it is an interference in the age-honoured rights and freedom of the profession, and it is the back door to nationalization, a mandate for which was most certainly not given to this or any other government, as shown by the recent referendum.

Yours, etc.,

S. L. FREDMAN.

75, Westgarth Street,
Northcote,
Victoria.
April 11, 1945.

## MEDICINE IN THE U.S.S.R.

SIR: I have noticed with interest the letter of Dr. L. E. Hewitt on medicine in the U.S.S.R. which appeared in the issue of April 21.

For the information of Dr. Hewitt and other members of the Association, I would like to state that *The American Review of Soviet Medicine* is in the library of the New South Wales Branch.

Yours, etc.,

J. G. HUNTER,
Medical Secretary.

British Medical Association House,
135, Macquarie Street,
Sydney.
April 20, 1945.

## AS OTHERS SEE US.

SIR:

"O wad some power the giftie gie us
To see oursel's as ithers see us!"

The following extract is from a letter which a university undergraduate, now in the army, wrote to his mother. She showed it to me that I might tell her what she was suffering from. It is so descriptive of the impersonal attitude some of us take with our patients that you may see fit to publish it.

Yours, etc.,

"PHYSICIAN."

April 16, 1945.

Just a line to let you know I am in hospital. This time it is my heart. The trouble is not serious. I feel well, look well and eat well. I could carry on all my normal duties when I came here.

However, I am a curiosity. On my arrival at the C.C.S., the admitting quack went over me, muttering "intriguing" at intervals, and then called his colleague, who thought of the brilliant idea of half-strangling me. Both agreed that it was very interesting and they sent me to the ward. I was allowed to lug my half-ton of gear to the pack store and what remained to the ward, but once in there I was confined to bed. Here I was neglected for two days except for the sisters who took the confined to bed order very seriously. In fact, one orderly was whittled down to the size of a pin by a sister for allowing me to get out of bed while he made it.

On Monday they took an X ray. On Tuesday the major had another go at strangling me and failed; so on Wednesday they sent me to the A.G.H. Here I had to answer all the questions once again. By the way, did I ever have a goitre and did I ever have a fever with aches in the joints, etc.? The admitting M.O. had a fly at gouging my eyes out and was quite incredulous when I told him that it hurt.

So here we are with a very rapid pulse with a variable pace. That is all they can find wrong with me. No one worries about it, me least of all and the sisters most of all. They have their orders. If I wanted to form a Prussian Guard I would form it of sisters.

I will let you know when they are shanghaiing me back to the unit. Pray God it isn't Con. Camp. I have wanted to ask some of these details, but every time it came to my turn to ask questions the quacks were busy thinking up some other colleague who would like to listen in. I feel like a radio set.

# Obituary.

## RUPERT MAJOR DOWNES.

THE late Major-General Downes was associated with the military services of this country from his boyhood. He joined the Victorian Voluntary Field Artillery as a trumpeter, in that capacity taking part in the ceremony of the opening of the first Australian Federal Parliament by the late King George V (then Duke of Cornwall and York) in 1901. Immediately after qualifying for his medical degree at the University of Melbourne, he was appointed to a commission in the Australian Army Medical Corps in 1908 with the rank of captain. In the early days of service his efficiency and enthusiasm were outstanding, and on volunteering at the outbreak of the 1914-1918 war he was appointed to command the Second and shortly afterwards the Third Light Horse Field Ambulance. At the age of thirty he was the youngest ambulance commander in the Australian Imperial Force. He led his ambulance to Gallipoli, where he had many opportunities of showing his great ability as a commander. During the severe fighting which followed, his never-failing energy, coolness in action, his honesty of purpose and determination to share dangers and privation under the same conditions as his men, earned him their respect and admiration.

After the evacuation of Gallipoli he was appointed Acting Director of Medical Services, Anzac Mounted Division, and in August, 1917, Deputy Director of Medical Services, Desert Mounted Corps, a position which he filled until January, 1919. As the senior Australian medical officer in the area, he was responsible for the administration of all Australian medical personnel in the Middle East, both in the field and at the base in Egypt. His ability in both improvisation and organization was demonstrated in a variety of ways. He devised methods such as the use of camel cacolets and sledges for transport of casualties over the soft sands of the Sinai Desert. By division of a light field ambulance into two sections, a mobile and a tented, he was able to overcome the lack of a casualty clearing station and provide immediate treatment for casualties at the scene of action before conveyance back over the long stretches of desert to the tented section. In the swift advances which resulted from Allenby's later victories in Palestine and Syria he surmounted great difficulties in transporting casualties over tremendous distances with the aid of motor ambulances. He also organized a mobile surgical unit which was able to provide skilled surgical attention in the forward areas, thus foreshadowing the present-day mobile surgical team. He took vital steps to reduce the danger of dysentery and cholera, while his anti-malarial campaign was so vigorous and successful that the Desert Mounted Corps was able to garrison the Jordan Valley during the summer of 1917 and advance to rout the Turks at Damascus in the winter of 1918. His worst trial came at Damascus, when after a two hundred miles advance through country previously occupied by the Turks, the troops became heavily infected with malaria, and an outbreak of influenza coupled with the capture of enemy sick and wounded who were without medical attention, presented an almost insuperable problem. Stricken himself with malaria, Downes remained at his post and carried the medical service through one of the most difficult and trying periods of its history.

Downes's return to Australia led to no diminution in his activities. He resumed the practice of surgery from which he had necessarily been divorced throughout the war years. In addition he was requested to compile that portion of the medical history of the war dealing with the campaigns in Sinai, Palestine and Syria.

Of his association with the Venerable Order of the Hospital of Saint John of Jerusalem Dr. Arthur Sherwin has written.

It was obvious that his ability and experience should be utilized by the services, and in 1921 he was appointed Deputy Director of Medical Services, 3 Military District (Victoria). He then commenced to build up the Army Medical Corps along lines which he was able to extend later as Director-General of Medical Services at Army Headquarters.

His surgical connexions with various hospitals enabled him to meet younger members of the profession and stir them with something of his own enthusiasm, with the result that there was a continuous stream of applicants for commission. But he realized that war experience was often a valuable asset and so induced a certain number of older men to continue on the active list.

Perhaps the outstanding feature of his training methods was his insistence on the value of tactical exercises. These were held approximately twice a year and were fully availed of by medical officers of all grades. Carefully prepared in conjunction with the General Staff, these exercises were of considerable value in bringing the medical service into closer relationship with other branches. Downes was at his happiest and best on these occasions. He thoroughly enjoyed the interest aroused by the clash of differing views in the solution of problems, while the long hours of travel and exercise appealed greatly to his sense of the value of physical fitness. Later as Director-General of Medical Services at Army Headquarters he was able to extend interest by holding such exercises for senior officers of the Australian Army Medical Corps, based on appreciations of an invasion and problems arising therefrom. Quite a large proportion of the medical plans actually adopted to meet the threatened Japanese invasion was thus envisaged and tested on the ground in the years immediately preceding the outbreak of the present war.

In 1933 came the tragedy of the death of his only son, John, at the age of eleven—a boy of bright and most engaging character, who was already making his mark at school with his keen brain and his skill in sport. Never has sorrow been met with greater fortitude. Here was the disciplined spirit not to be broken by any blow and able to carry on, grieving without complaint. Shortly afterwards a trip abroad to the United Kingdom was spent largely in the investigation of army medical problems and in post-graduate study in surgery of the central nervous system, which at that time interested him greatly.

In the following year the position of Director-General of Medical Services was relinquished by Major-General G. W. Barber, and Downes was urged by his friends, who realized the importance of the position and his outstanding qualifications for it, to apply for the appointment. It was fortunate for Australia that his claims were recognized.

His wide outlook, his extensive historical reading, and his intimate knowledge of current events inspired his work and formed a basis for a foresight which was remarkable. The acquisition of medical stores likely to be unobtainable in Australia after the outbreak of war, the establishment of the Medical Equipment Control Committee, the initiation of the Medical Coordination Committees (all matters that have proved of first-rate importance in the prosecution of Australia's part in the war), were due to his foresight and perseverance. The establishment of base hospitals such as Heidelberg and Concord was his conception, while many other army hospitals of a less permanent character were placed in locations envisaged by him.

In 1939 he made an overseas trip, visiting India, the Middle East, the United Kingdom, returning by America. This trip represented a supreme effort on his part to acquire the fullest possible information on all aspects of his work. He was convinced on his departure that war would come. By the time of his return it had already been declared. Then came the implementation of the plans so thoroughly laid beforehand. The decision to send an expedition abroad found him prepared, while the trained personnel for whose state of readiness he had been chiefly responsible were standing by.

For the next eighteen months all these urgent problems together with the organization of new units and the supply of medical reinforcements abroad filled his life to overflowing. But somehow he managed to give time to auxiliary services such as those of the Order of Saint John and the Voluntary Aid Detachments. The chairmanship of the Australian Red Cross Society, which he had held for nearly twelve months, he felt compelled to relinquish in November, 1939.

His opportunity to see the results of many years of work came with his appointment as Inspector-General of Medical Services in 1941. This involved an overseas visit in 1941 which included Malaya and the Middle East. This gave him the chance of seeing in the various operational areas many of the medical officers whom he had trained. He might well feel a thrill of pride in the results of his work and a sense of real happiness in the welcome given him wherever he went. Outside the limits of the Australian Imperial Force he found friends everywhere, for his work in the 1914-1918 war and his visits overseas subsequently had given him a constantly enlarging circle of professional friends, as well as a continuously enhanced reputation. It was fitting that he should have been able to visit again large parts of Palestine and Syria, so closely linked with his brilliant career as Acting Director of Medical Services, Anzac Mounted Division, and Deputy Director of Medical Services, Desert Mounted Corps.

Following his return to Australia in 1942 came his appointment as Director of Medical Services, Second Army, which continued until his recent retirement from the active list. But he was not to be allowed to leave the military scene in which he had been for so long a leading figure. He was invited to write the medical history of the present war, an undertaking of great responsibility viewed either from the magnitude and importance of the subject or from the inevitable comparison with that of the last, performed so supremely well by Colonel A. G. Butler and aided appreciably by General Downes himself. It was realized that he was preeminently fitted for the position of medical historian, with his unrivalled knowledge of the origin and development of the manifold activities of the medical services. Since his appointment he had been working with characteristic energy and foresight in planning the general outline of the project and in obtaining, wherever possible, information at first hand of the work of the armed forces.

He was actively engaged in this way when the end came, flying to New Guinea to see for himself the front-line conditions in this special phase of modern warfare.

He went to his death on duty, willing to take whatever risks might come. He was brought up in the military tradition and his life was spent ennobling it. As seen in him, it comprised far higher things than the practice of war with its inevitable horrors and cruelties. It meant self-discipline, high courage both in body and soul, unswerving loyalty, complete honesty and friendliness to those in need. Such are the attributes that constitute character and leadership. We have had no finer example of them than Major-General Rubert Downes.

Few men have been granted the happiness in his home life that came to Rupert Downes. In joy and in sorrow he had the unswerving help and loyalty of a devoted wife and the deep affection of his two daughters. His wife, like himself, has earned the gratitude and affection of the community by her character and her way of life. May the evidence of this feeling help in some measure to ease the great sorrow that has come upon her and her family.

DR. W. G. D. UPJOHN writes: Though he was born in Australia and never thought of himself as anything but an Australian, Rupert Downes was, particularly in his younger days, a living embodiment of the virile, honourable, military officer so well portrayed by Kipling in his many stories of soldier life in India. He came of a military family and he grew up in surroundings where the accepted standards of manliness were those of the British military officer of the late Victorian era. Those standards of honour, duty and behaviour he maintained steadfastly throughout his life.

His thoughts must have turned to the military life in childhood, for as soon as he could be admitted to the military forces he became, as a youth, a trumpeter in the artillery in the late years of Victoria's reign. His military service in the Australian military forces continued unbroken through succeeding reigns till the time of his retirement just prior to his death. He did not become a combatant officer, but graduated in medicine and immediately joined the Australian Army Medical Corps in the old volunteer army long before compulsory military training was adopted in Australia.

The strong interest he early showed in military medical affairs was obvious to everyone, and though he had done an excellent medical course and always maintained a strong interest in surgery, his friends and acquaintances thought of him first and foremost as a military officer rather than a civil surgeon. At one time, not long after graduating, he had serious thoughts of joining the medical services with the Indian Army, but fortunately for Australia other occurrences deflected him from these intentions.

Army medical activities could occupy only a part of his time while he was in the volunteer forces, and so his time was fully occupied in private practice, in teaching as a demonstrator in anatomy at the University of Melbourne, in tutoring at Ormond College, in working as a clinical surgical assistant at the Melbourne and at the Children's Hospitals, and in studying for a higher degree in surgery. In 1912 he was successful in passing the examination for the Master of Surgery degree in the University of Melbourne, and it seemed likely that before very long he might look forward to an appointment on the honorary surgical staff of the Melbourne Hospital. This, however, was not to be, for with the outbreak of war in 1914 he joined the Australian Imperial Force and went abroad.

The great value of the administrative work which he carried out in Egypt, Gallipoli and Palestine is recorded elsewhere and will ever be remembered whenever the history of Australia's part in warfare in these countries is recalled. It meant for him, however, that for the war years he relinquished practising surgery.

When he returned to Australia and was an applicant for a vacancy on the staff of the Melbourne Hospital as an out-patient surgeon, he was still a young man, but there were other applicants a little younger who were thought to be of the age more suitable for appointment, having in view the age at which they would become eligible for in-patient surgeon appointments, and Rupert Downes did not receive an appointment. He felt this very much, but it was characteristic of his nature and code of behaviour, that he remained friendly with his younger successful competitors and advanced their interests when it lay in his powers to do so. He never complained or protested against the decision.

With the coming of peace and the retrenchment in military establishments there was no full-time permanent military post for him, and as he had not gained an appointment as surgeon at the Melbourne Hospital, he diverted his energies to his work as a surgeon, mainly in children's diseases. His services to the Children's Hospital as an honorary surgeon were most highly appreciated, and he took an active part in extending the activities of the hospital, particularly in setting up the orthopædic hospital at Frankston.

Incidentally it is interesting to note how many of the younger medical officers who came in contact with him at this period, became affected by his sustained interest in the Army Medical Corps, joined as junior officers in peace time and are now numbered among the most valued medical officers serving Australia in the present war.

Rupert Downes, by his own obvious, deep, serious and unselfish interest in promoting the efficiency and activity of the Army Medical Corps, inevitably excited the interest of younger medical men in military affairs. He had the happy facility of imbuing them with the proper sense of duty and of evoking their sustained interest. He was not given to exhortations; but his own demeanour, actions and example indicated quite clearly what was correct and what should be expected in an army medical officer. In the long dreary years of pacifism, when the fortunes of the Australian military forces were at their worst, when material and financial help seemed to be steadily decreasing, he received the greatest encouragement and the sincerest pleasure from the wholehearted interest and energy displayed by these young officers in the staff rides and military exercises which he devised for their benefit.

Arising partly from his association with the Children's Hospital and partly from his teaching and demonstrating in the anatomy school, he came to take an active part in the training and registration of masseurs in Victoria. He became chairman of the Masseurs' Registration Board and retained this office till 1939, when he was obliged to relinquish it owing to other duties making heavy demands on his time. Linked with his military and professional life was his long association with the Order of Saint John, whose welfare and progress he ever sought to promote.

There was another body which he served long and conscientiously, and that was the Victorian Branch of the British Medical Association. He served on the Branch Council for many years and was elected President of the Victorian Branch in 1935. He always considered this as one of the greatest tributes paid to him by his fellow practitioners, and arising from his activities on the Council was an appointment which he likewise felt to be a personal tribute and honour. This appointment was one at the Melbourne Medical School, to give a short series of lectures on professional conduct and medical ethics. He certainly was proud of his selection by the Council as a suitable member to give these lectures.

The Council of the Victorian Branch at a recent meeting adopted the following minute:

> The Council of the Victorian Branch of the British Medical Association records with deep sorrow the passing of Major-General Rupert Major Downes, C.M.G., V.D., M.D., M.S., F.R.A.C.S., who served his country for more than fifty years. Commencing his military career at the age of nine years in the artillery, he served with distinction as D.D.M.S., Desert Mounted Corps, in the war of 1914-1918, and then during the difficult years of peace rose to the highest medical post in our army—Director-General of Medical Services—and there, by his enthusiasm and personal direction, stimulated and guided the training of those medical officers who were later to bear the heat and burden of the days of battle.
>
> His directness, his robustness, his disdain of intrigue in any form, were his inspirational qualities to a rare degree, and the success of the medical service in this war must be credited to Rupert Downes.

As Army Medical Historian he desired to see for himself the conditions of the New Guinea campaign, and on the way he lost his life, dying as he had lived—on service.

For many years Rupert Downes served on the Council of the Victorian Branch of the British Medical Association, ultimately as president. The Council expresses its sincere sympathy to Mrs. Downes and her family.

"He indeed is of great stature, whose shadow reaches to posterity."

Eventually a time came, after General Barber had retired from the office of Director-General of Medical Services, when Rupert Downes took over the duties of this office. This was a step that he took with considerable reluctance, for it meant giving up the active practice of surgery which had occupied so many years of his life and for which he had trained himself so thoroughly as a young man. He relinquished his private practice as a surgeon, but continued as long as he could to carry out some surgical work in an honorary capacity at the Children's Hospital and at the Prince Henry Hospital in Melbourne.

As Director-General of Medical Services he had much to do and had little help, for it was a period when Australia took very little interest in matters concerned with naval and military efficiency. It was left to a comparatively few officers like Downes to foster in a younger generation the spirit of national service and by their own decent but unostentatious dutiful lives, preserve from extinction the tradition that it is honourable to serve one's country as a soldier without counting the cost and without consideration of material reward. Though he received little official encouragement and was at times opposed or hindered by some who could not understand his far-sighted plans, he continued steadfastly in his endeavours to prepare for a war which he felt would inevitably come before many years.

Though the means at hand were meagre for supplying the necessary staff and equipment, he laboured continually at drawing up plans for what would be required in the army and in Australia as a whole, both in personnel and equipment, to meet the needs of the country when it should be caught up in a modern world war.

When war came, Downes knew what had to be done; but he was in difficult straits to get what he required to provide hospital accommodation, appliances, materials for treatment, and all the many necessities suddenly needed for Australian soldiers in scattered parts of the Commonwealth.

He had a tremendous task which could be accomplished by sticking to essentials and letting embellishments wait. That he made a success of this task, everyone who knows the difficulties with which he had to contend, will agree, and his many friends, who recognized how he had overcome these difficulties, had hoped that his long devotion to the work of bringing the Australian Army Medical Corps to its present high reputation and efficiency, would receive the recognition of some award or honour. However, he left the office of Director-General of Medical Services for other duties, and the most active part of his military life terminated without any public recognition of his long, valuable and unselfish service to Australia.

He left, however, a highly efficient service as a monument to his many years of dutiful labour and intelligent foresight, and perhaps in a sense one may look on the vast base hospitals near the capital cities as material monuments to him and those whom he selected to work under him.

When he finally left the service he was offered and accepted the position of medical historian. He was well fitted by nature, by education, and by his past experience to carry out this work, and he was full of enthusiasm for the great task which it involved. In fact, he was probably happier in the last few months of his life than he had been for a long time past.

His military work had always been full of interest for him, but it depressed him to find his best endeavours brought to nothing by misunderstanding, stupidity or official inertia; even more he was disgusted at times at evidence of plotting and intriguing.

It seemed to be his lot to be often within reach of having his hopes fulfilled and attaining complete success and then at the last to suffer some hard blow of fate that deprived him of the happiness of his expectations. He felt these misfortunes as much as any man, but in adversity he behaved with a silent stoicism that compelled one's admiration.

His long and many valuable public services merited some mark of recognition or distinction, and it has been a source of wonder and regret to many that no such honour was bestowed upon him since he received the C.M.G. in the last war, but if it is conceded that it is an honour for it to be widely recognized that one has maintained throughout life an undeviating straight course of conduct directed by a high but unobtrusive sense of duty, that it is an honour to have acquired a reputation for fairness, giving full recognition to merit in others whether they be friends or opponents, while being able to pass over magnanimously injuries from personal detractors, that it is an honour and distinction to have won the loyalty, respect and esteem of worthy colleagues and subordinates, in good fortune and in bad, then surely no man achieved higher honour in Australia than Rupert Major Downes.

Sir Alan Newton writes: I have enjoyed and valued the friendship of Major-General Downes for most of my life. We were at the same school; we obtained the degree of Master of Surgery on the same day; we were colleagues in surgical practice, and, in recent years, I was privileged to be closely associated with him in administrative work during this war. There is very much, therefore, that I should like to write about the great service which he gave to Australia, but, as others of his many friends are anxious to pay tribute to his memory, I have been asked to confine myself to an account of the work he did to coordinate the supply of medical equipment and medical personnel to meet the needs of the services and the civil population during the war.

It is not generally known that much of this work was done long before the outbreak of war. Soon after his appointment as Director-General of Medical Services, Major-General Downes, mindful of the cardinal principle that an army cannot fight without material, began an investigation of all the problems relating to the supply of medical equipment in wartime. He acted as chairman of a special Army Board, formed in June, 1935, which not only reorganized army medical equipment, but also made a most valuable survey of the possibilities of expansion of local manufacture in this field. The report of this board makes interesting reading today because it envisaged the wartime control of the manufacture, sale and distribution of medical equipment in the manner later carried into effect by the Medical Equipment Control Committee. Incidentally, it also advised the immediate purchase and storage of large quantities of quinine, and the encouragement of local manufacture of many other items of equipment. There followed the usual frustrations and delays due to the exercise of over-ruling authority by those lacking special knowledge of the subject, but Major-General Downes continued his work with the greatest energy and persistence. He inspected instruments made of steel produced on request by the Broken Hill Proprietary Company and investigated the annual consumption of essential medical equipment in Australia. As the war clouds gathered, his efforts increased and the next important step was the creation of a Medical Equipment Subcommittee of the Committee for the Coordination of Medical Services. The Munich crisis arose before this committee had been formally established, but an emergency meeting was held in September, 1938, under his chairmanship. Dr. M. J. Holmes was sent urgently from Canberra to represent the Commonwealth Department of Health at this meeting, and it was decided forthwith to prepare lists of medical equipment not manufactured in Australia which were considered essential for the civil community so that orders could be placed at once overseas for their purchase. Payment was to be made from certain trust funds held by the Commonwealth Department of Health. Thus it came to pass that a most valuable reserve of medical equipment was obtained and earmarked for the civil community, which should never cease to be grateful to Major-General Downes and the Commonwealth Department of Health. Finally, in December, 1939, the Medical Equipment Subcommittee became the Medical Equipment Control Committee which was given appropriate powers under *National Security Act* Regulations, upon the recommendation of Major-General Downes, and its subsequent development has been built upon the foundations which he laid with such vision.

His work in relation to the coordination of military and civil medical services was equally notable. This problem had been investigated by a committee, established for the purpose in 1927, which recommended that there should be unfettered control in time of war by the Commonwealth Department of Health aided by an advisory committee which would include a representative of the medical profession, not, be it noted, the British Medical Association. Major-General Downes vigorously and successfully opposed this recommendation, with the help of Major-General Fetherston, and, ten years later, was responsible for the creation of a more democratic body, the Committee for the Coordination of Medical Services, consisting of himself as chairman, the

Director-General of Health, the Director of Naval Medical Services, the Director of Army Mobilization and two representatives of the British Medical Association. This committee held its first meeting in August, 1938, and, with some changes in composition and alterations in name, has continued to function since that time. It will thus be seen that, as was the case in the medical equipment field, the successful provision of medical services for the armed forces and the civil population in Australia during this war derived from recommendations made by Major-General Downes.

Others have written of the great work which he did for the army, but I hope that it is clear from this necessarily very abridged account of his coordination work, that he took a broad view of his duties as Director-General of Medical Services. He was mindful at all times of the requirements of the civil population and strove to hold the balance truly between rival service and civil claims. In other words, he recognized the true meaning of the word "coordination". He was first and foremost a soldier, but he was never a narrow-minded soldier. He was also a champion of the rights of his civil medical colleagues and a guardian of the legitimate medical needs of his fellow citizens. He drew his plans with great forethought and, having determined where the path of duty lay, he followed it, despite uninformed opposition. He saw the right road so clearly that he felt that elaborate justifications of his actions were not necessary. It appeared to him that everybody would see the light in due time, and, in any event, explanations savoured of self-advertisement, which he abhorred.

The son of a great soldier who was also a major-general, he died as he would have wished to die, in uniform on his way to the field of battle. He leaves many devoted friends, who will mourn for him, but will take comfort from the knowledge that his record of service to his country will be his enduring and inspiring monument.

COLONEL A. GRAHAM BUTLER writes: The untimely and tragic death of Major-General Rupert Downes, as well as a most poignant sense of sorrow for his wife and family, and grief for the loss of a friend and valued member of our profession, has involvements which quite properly may be termed national. I refer to the great task to which recently he had set his hand—that of editing and writing the Australian medical history of this second world war. I have thought that perhaps a personal note on this may be proper and seemly in connexion with your notice of his death and appreciations of his friends and colleagues.

I can say with assurance that he had taken up his task with an enthusiasm and determination—though with full appreciation of its difficulty and magnitude—that greatly encouraged those of us who have some special interest in this matter. With great courtesy and a most attractive attitude of cooperation he had submitted "for advice and criticism" his scheme for the whole history. Without transgressing official or personal confidence, I can say that the scheme itself promised well; and that the ensuing correspondence revealed a broad outlook and a determination to utilize to the utmost all the resources of the civil departments concerned, as well as those of the services themselves, in the endeavour to achieve the objective set for the medical history of this war, namely, prompt production, and appeal to a wide circle of readers, especially within the medical profession of Australia.

As a bounden duty and as well a proper tribute I should like to put this on record of his part in the writing of the history of the last war. When, in the early stages of the work, Colonel Downes was invited to write the section on the medical history of the Light Horse, he wished to tackle the job on the lines of a series of self-contained studies on the various problems, which should be related to events and operations by a general narrative. My own plan for the history, as medical editor, envisaged a direct and immediate association of professional and technical problems with the actual course of military events. Though it went against his own opinion and preference, Downes accepted without demur, though with regret, my views on the writing of his section (which was, and I think still is, the most exact study yet made of Light Horse medical work), and also the subsequent editing, in a "soldierly" spirit of obedience to the decisions of proper authority.

Whether the decision was right or wrong now matters little; I record the episode as disclosing (as I suggest) the keynote in Downes's character, and in some sense, perhaps, the conduct of his life, especially his military life. Both by tradition and by temperament Downes was "a soldier to his finger tips", with, as I shall add, in friendship and deep respect, the strength and the weakness of the outlook on life engendered thereby. From the professional standpoint, and that also of the medical service, this attitude may at times have had its drawbacks. This is not the place to discuss the far-reaching issues involved. But it is necessary to bear in mind this attitude—if, indeed, I shall have interpreted his mind aright—when assessing General Downes's place in Australian history.

But at this moment one need, and can, think only of his handsome, manly presence, his courteous dignity, of the high ability and the vigour with which he applied himself to every task he took in hand. Last, but first in the memory of his friends, we think of the happy family life, of the noble fortitude with which, with his wife, he faced the sorrow of their little boy's death, of the charm of the social circle which together they had created. The memory of these will remain.

COLONEL ARTHUR SHERWIN, President of the Victoria Centre of the Saint John Ambulance Association, writes: Apart from General Downes's medical profession and army career, probably the keenest interest and greatest pleasure was his association with the Order of Saint John in this State. His honorary service with this body commenced over twenty-four years ago when he succeeded the late Dr. George Horne as Assistant Commissioner of the Saint John Ambulance Brigade in Victoria; later he was promoted to the rank of commissioner in this organization. His knowledge of army administration was invaluable, and his personal enthusiasm an inspiration to all those who served under him.

He joined the Saint John Ambulance Association in November, 1921, and held the office of president for the years 1929, 1930, 1933, 1934, 1937, 1938, 1941 and 1942.

His outstanding services to the Venerable Order of the Hospital of Saint John of Jerusalem were first recognized in the year 1929 when he was admitted to the order with the grade of "commander", and again in 1937 when he was promoted to the grade of "knight".

General Downes was keen that a Commandery of the Order of Saint John should be established in Australia, and along with others worked to this end. On its formation he became a foundation member and was a member of both the Council and Chapter.

The transport of the sick or injured was another of his interests, and for many years he was a member of the Victorian Civil Ambulance Service Committee. In this society he held the office of president for the years 1937-1938.

The late General Downes's knowledge, sympathy and understanding of ambulance work in its many spheres made him an acquisition to these organizations, and in the handling of problems his counsel was always to be relied upon. All members of this great organization mourn the loss of an able administrator who was also to so many a personal friend.

## FRANCIS FREDERICK MUECKE.

WE regret to announce the death of Dr. Francis Frederick Muecke, which occurred recently in England.

## ALFRED GERVASE PENNY.

WE regret to announce the death of Dr. Alfred Gervase Penny, which occurred at Artarmon, New South Wales, on April 16, 1945.

## THOMAS EWING.

WE regret to announce the death of Dr. Thomas Ewing, which occurred on April 21, 1945, at Mosman, New South Wales.

# National Emergency Measures.

## MEDICAL EQUIPMENT.

THE chairman of the Medical Equipment Control Committee directs attention to the fact that X-ray film is scarce throughout the world, and it has been found necessary to decrease the quantity available for civilian medical use in Australia by 50%. A similar reduction has been made in the United States of America and in the United Kingdom.

It is imperative, therefore, that all medical practitioners should cooperate in the task of achieving the utmost economy in the use of X-ray film, because, if they fail to do so, a time will come when none will be available.

An X-ray examination involving the use of film must not be ordered unless this diagnostic step is absolutely essential in the treatment of the patient. The smallest size of film consistent with efficient investigation must be used and the number of pictures taken of each individual patient must be reduced to an absolute minimum.

The firms concerned with the sale of film will reduce sales forthwith by a cut of 50% estimated on the basis of past orders placed by each purchaser.

## Post-Graduate Work.

### A FILM AFTERNOON AT SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that at 4.30 o'clock p.m. on Wednesday, May 2, 1945, a talking film by G. B. de Lee, entitled "The Use of Forceps", will be shown at the Stawell Hall, Royal Australasian College of Physicians, 145, Macquarie Street, Sydney. It will be followed by a commentary by Professor B. T. Mayes.

All civilian medical practitioners and service medical officers are invited to attend. There will be no charge for admission and anybody requiring further information should communicate with the Secretary of the Post-Graduate Committee, 131, Macquarie Street, Sydney. Telephone: B 4606.

### LECTURES IN MELBOURNE.

THE Melbourne Permanent Post-Graduate Committee has arranged for a series of lectures on diseases of the chest to be conducted at the Austin Hospital, Heidelberg, at 2.15 o'clock p.m.

May 17, 24 and 31: by Dr. Hilary Roche on tuberculosis

June 7: by Dr. C. H. Fitts on non-tuberculous conditions.

June 14: by Mr. C. J. O. Brown on surgery of non-tuberculous conditions.

The fee for this course is £2 2s., and entry should be in the hands of the Secretary of the Committee, Royal Australasian College of Surgeons Building, Spring Street, C.1, by May 3.

## Medical Prizes.

### THE STAWELL MEMORIAL PRIZE.

ACTING on the recommendation of the examiners, the trustees have awarded the Stawell Memorial Prize for 1944 to Major Noel Gutteridge for his essay, "The Influence of Diet in Health and Disease".

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Friedlaender, Erich Martin Caesar, M.D., 1908 (Univ. Giessen, Germany), 141, Macquarie Street, Sydney. Recommended and approved for registration in terms of Section 17 (2) of *The Medical Practitioners Act*, 1938.

Lush, Studley Woolcott, M.B., B.S., 1937 (Univ. Sydney), 101, Victoria Road, Bellevue Hill.

Burton-Bradley, Claudia Portia, M.B., B.S., 1943 (Univ. Sydney), 92, Ingham Avenue, Five Dock.

## Medical Appointments.

Dr. Ernst Flaum has been appointed Honorary Medical Officer to the Electrocardiograph Section of the Royal Adelaide Hospital.

Dr. John Kellerman Adey has been appointed medical officer and superintendent of the government institution for the reception, control and treatment of inebriates situated at the Mental Hospital, Royal Park, and known as the Female Inebriates Home, Royal Park, in pursuance of the regulations made under the *Inebriates Act*, 1928, Victoria.

Dr. Robert Frank West has been appointed temporary Honorary Assistant Physician to the Electrocardiograph Section at the Royal Adelaide Hospital.

## Diary for the Month.

MAY 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAY 2.—Victorian Branch, B.M.A.: Branch Meeting.
MAY 2.—Western Australian Branch, B.M.A.: Council Meeting.
MAY 3.—South Australian Branch, B.M.A.: Council Meeting.
MAY 4.—Queensland Branch, B.M.A.: Branch Meeting.
MAY 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAY 8.—Tasmanian Branch, B.M.A.: Ordinary Meeting.
MAY 11.—Queensland Branch, B.M.A.: Council Meeting.
MAY 14.—Victorian Branch, B.M.A.: Hospital Subcommittee.
MAY 14.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

*New South Wales Branch* (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

*Victorian Branch* (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

*Queensland Branch* (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

*South Australian Branch* (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

*Western Australian Branch* (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All Public Health Department appointments.

## Editorial Notices.

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